EduBioMed

CAPACITY BUILDING FOR EDUCATION AND APPLIED RESEARCH IN MEDITERRANEAN UNESCO'S BIOSPHERE RESERVES

Report from Task 2.9

BASELINE FOR CURRICULA DEVELOPMENTS

FOR HIGHER EDUCATION IN MEDITERRANEAN BIOSPHERE RESERVES

Authors

The present report was drafted in collaborations between responsible based at the following Partner Organizations: UAB; MAB France; UM5; UNIMED

About Edu-BioMed

The project aims to strengthen, improve and upgrade academic activity at four Moroccan and Lebanese Higher Education Institutions (HEIs) in the context of Mediterranean Biosphere Reserves (BRs), in collaboration and through networking with BRs' stakeholders (citizens, visitors, managers and technicians), public administrations and EU Partners.

Project Partners:

- Universitat Autònoma de Barcelona, UAB, Spain (coordinator)
- Université d'Aix Marseille, AMU, France
- American University of Beirut, AUB, Lebanon
- Université Saint-Joseph, USJ, Lebanon
- Université Cadi Ayyad, UCA, Morocco
- Université Mohammed V de Rabat, UM5, Morocco
- MAB France, France
- Association for the Protection of Jabal Moussa (APJM), Lebanon
- UNIMED – Mediterranean Universities Union, Italy

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Abstract (for dissemination)	The upgrading of curricula at targeted HEIs is among the specific objectives of Edu-BioMed. Each MENA HEI is already equipped with MSc programs related to MAB Program scope. The idea of Task 2.9 is to further build the capacity of HEIs further to provide education in and around the topic of Biosphere Reserves and set the basis for future curricula development opportunities.

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1. Introduction

1.1. The Edu-BioMed Project

This document is published in the frame of Edu-BioMed, an international cooperation project co-funded by the Erasmus+ Capacity Building in Higher Education programme of the European Union during the period 15 November 2018 - 15 November 2021[1].

The project aims to strengthen, improve and upgrade academic activity at four Moroccan and Lebanese Higher Education Institutions (HEIs) in the context of Mediterranean Biosphere Reserves (BRs), in collaboration and through networking with BRs' stakeholders (citizens, visitors, managers and technicians), public administrations and EU Partners.

'BR' is a UNESCO label for territories composing a mosaic of natural protected areas, cultural heritage, human settlements, and land use designations for small-scale, eco-friendly economic activity. The designation falls under the auspices of UNESCO's "Man and Biosphere" (MaB)[2] program, whose aim is to explore solutions for the improvement of relationships between people and their environments on a multidisciplinary scientific basis.

¨Edu-BioMed's aim is to strengthen, improve and upgrade academic activity at four Moroccan and Lebanese universities in the context of Mediterranean Biosphere Reserves, in collaboration and through networking with BRs' stakeholders¨

The four beneficiaries of the action are the American University of Beirut (AUB), the Saint Joseph University of Beirut (USJ), the Université Cadi Ayyad of Marrakech (UCA) and the Université Mohammed V of Rabat (UM5). Five other organizations support these HEIs in pursuing such aim: the Universitat Autònoma de Barcelona (UAB, project coordinator), the Aix-Marseille University (AMU), MAB France, UNIMED and the Association for the Protection of Jabal Moussa (APJM).
Please consult the Project Card[3] and the Project Website for more information.

1.2. The Task 2.9 of the Edu-BioMed project

The upgrading of curricula at targeted HEIs is among the specific objectives of Edu-BioMed. The idea of Task 2.9 is to further build the capacity of HEIs further to provide education in and around the topic of Biosphere Reserves and set the basis for future curricula development opportunities.

[1] Project reference code: 598924-EPP-1-2018-1-ES-EPPKA2-CBHE-JP
[2] http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/
[3] https://ec.europa.eu/programmes/erasmus-plus/projects/eplus-project-details/#project/598924-EPP-1-2018-1-ES-EPPKA2-CBHE-JP

In the following paragraphs, a set of guidelines for higher education in Mediterranean Biosphere Reserves are presented with the aim to pave the way for future curricula developments in the field.

2. Guiding Principles and Criteria for Higher Education in and on Biosphere Reserves

2.1. The Biosphere Reserve as an education-management model

In 1971, UNESCO set up the Man and the Biosphere (MAB) programme, which works responsibly to build societies in harmony with the biosphere and aims to establish a scientific basis for improving human-nature relations at the global level. This intergovernmental programme now accompanies the UN's Agenda 2030 for sustainable development and relies on its worldwide network of experimental sites, the Biosphere Reserves (BRs).

Biosphere Reserves are privileged areas where sustainable development practices can be tested at the regional level. The challenge is to reconcile the social and economic development of local populations with environmental protection, based on their involvement. These Biosphere Reserves are places with protected terrestrial, marine and coastal ecosystems where activities compatible with sustainable biodiversity conservation practices are developed. They constitute sites that can strengthen research, monitoring, training and education and promote interdisciplinary approaches. They constitute a model of sustainable territorial management whose implementation can take various forms, based on diversified governance.

2.2. What training for those dealing with a Biosphere Reserve?

Training systems must face up to the challenges of sustainability, and be accompanied by an evolution of training the changes that are essential to face environmental challenges, in particular the climate and biodiversity loss crises. Beyond their direct effects, it is clear that they will lead to major social and economic upheavals that will test societies and their ability to live in peace and in harmony with their environments.

Through its organization (3 interconnected functions and zoning), the Biosphere Reserve proposes the implementation of an integrated project on a territorial scale. The very notion of integration implies multidisciplinarity.

A set of diversified skills is required to work on the different aspects of the human-nature relationship and land management: from ecology and knowledge and conservation of biodiversity to land use planning, from urban planning to architecture, from database management to geographic information systems, from agronomy and forestry sciences to local development, from management sciences to law and public policies, from economics to education and communication sciences, from natural to social sciences, the panel is very broad. The people in charge of these different aspects can form a multidisciplinary team leading a territorial project within the same structure and relaying thematic structures or channels, as is the case for the NRPs in France. They may also be spread across different agencies, in which case they will be required to collaborate.

However, cross-cutting notions should also be acquired in order to facilitate and consolidate the integrated approach to human-nature relations and local participation.

2.3. What cross-disciplinary education?

The Biosphere Reserve implies putting multidisciplinary itineraries at the service of a collective project, the management of a territory considering the conservation of biodiversity and the environment and the development of populations, with the support of research and scientific monitoring, training, education and communication.

In order to put integrated management into practice, students should master concepts relating to socio-ecosystems. This implies addressing the evolution of concepts and practices: history of human/nature relations, philosophy of the environment, biodiversity dynamics and ecosystem services, ecological solidarity, dynamics and resilience of socio-ecosystems, etc.

Focus should also be put on the notion of common goods, the modalities of collective action, integrated coastal zone management, governance of protected areas and territories ("Ecosystem-based management" and adaptive co-management), contractual approaches. Students should be familiarized with the notions of social and solidarity economy and circular economy.

The Biosphere Reserve concept should be taught as such, as a model of integration: Seville strategy, legal and institutional aspects, world network, examples of implementation, Sustainable Development Goals (SDGs).

Students should also be familiarized with the concepts and approaches aimed at involving different publics in the management of Biosphere Reserves, in order to co-construct a sustainable territorial project with local stakeholders: interviews, participatory diagnosis, analysis of stakeholders' games, participatory approaches, mediation, conflict management, participatory science.

Other elements are important in the social and human science realm, like the access to the qualitative method and tools: students should be introduced to qualitative methods and their uses. This is very important to understand attitudes and representations. Also, the work on actors and governance: being an important aspect for biosphere reserves and the difficulty of coordinating between stakeholders in the biosphere. Students should be also be equipped with notion on the legal frameworks and laws in force in the biosphere concerning water, forest, soil resources,...legal courses, ethics, norms, institutional frameworks.

Finally, knowledge of certain tools and concepts is nowadays essential in the implementation of projects: project management; geographic information systems; databasing and indicators.

2.4. Which approaches?

The implementation of the SDGs implies being part of a societal transition, creating new partnerships and strengthening local and international solidarity. The lessons should therefore encourage curiosity, initiative, openness on others and other cultures, listening and empathy. Collective and cooperative work should be privileged and students should be given the keys to carry it out.
The work of students, alone or in groups, on concrete projects is necessary. Ideally, commissions or proposals for studies or analyses should come from real territories. This reinforces the interest and commitment of the students and puts them in a professional situation. The teachers place themselves in a position of accompaniment and can feed their courses with these concrete examples. The projects show the complexity of concrete management situations and require collective work.
Moreover, the importance to create bridges between BR management and academic activity has emerged as key for a sustainable management of the territories. In other words, BR management should inform educational programmes. BR management staff should be involved as teaching actors themselves, and inform applied research.

2.5. Which cross-cutting competencies?

Developing curricula requires the establishment of clear learning objectives.

Following the directives of UNESCO[4], learners in the sustainability studies field should be equipped with the competencies listed in the following (Figure 1). We integrate the above list of soft skills with some Biosphere Reserves studies-specific competences (Figure 2). These are those with which a person dealing with BR management should be equipped.

[4] UNESCO, 2017. *Education for Sustainable Development Goals – Learning Objectives*. Paris. Available at https://unesdoc.unesco.org/ark:/48223/pf0000247444

Figure 1. Cross-cutting competencies in sustainability studies

Systems thinking competency: the abilities to recognize and understand relationships; to analyse complex systems; to think of how systems are embedded within different domains and different scales; and to deal with uncertainty.
Anticipatory competency: the abilities to understand and evaluate multiple futures – possible, probable and desirable; to create one's own visions for the future; to apply the precautionary principle; to assess the consequences of actions; and to deal with risks and changes.
Normative competency: the abilities to understand and reflect on the norms and values that underlie one's actions; and to negotiate sustainability values, principles, goals, and targets, in a context of conflicts of interests and trade-offs, uncertain knowledge and contradictions.
Strategic competency: the abilities to collectively develop and implement innovative actions that further sustainability at the local level and further afield.
Collaboration competency: the abilities to learn from others; to understand and respect the needs, perspectives and actions of others (empathy); to understand, relate to and be sensitive to others (empathic leadership); to deal with conflicts in a group; and to facilitate collaborative and participatory problem solving.
Critical thinking competency: the ability to question norms, practices and opinions; to reflect on one's own values, perceptions and actions; and to take a position in the sustainability discourse.
Self-awareness competency: the ability to reflect on one's own role in the local community and (global) society; to continually evaluate and further motivate one's actions; and to deal with one's feelings and desires.
Integrated problem-solving competency: the overarching ability to apply different problem solving frameworks to complex sustainability problems and develop viable, inclusive and equitable solution options that promote sustainable development, integrating the above-mentioned competences

Figure 2. Cross-cutting competencies in BR studies

Nature conservation competency: the abilities to understand biodiversity structure and dynamics, to understand a protected area and other conservation systems (species conservation, eco management); to map and protect its bio-geo-cultural diversity; to understand the institutional and legal framework in which the BR is established, and the stakeholder networks and relations that shape its governance structure and mechanisms.
Socio-ecological studies competency: the abilities to understand a landscape as a complex dynamic system where social, economic and ecological factors interact and shape the environment in a global change scenario.
Environmental management competency: the ability to design and implement a project of territory that is ecologically-economically-socially sustainable, involving local stakeholders in the decision making process.

Sustainability education competency: the ability to teach basic concepts about sustainability and global change related matters; to raise awareness about the factors that lead to socio-environmental degradation or restoration; to educate to the above mentioned competencies.
Interdisciplinary competency: the ability to integrate information from different sources and disciplines into multifaceted arguments that take into account the complexity of socio-ecological issues
Intercultural competency: the ability of cognitively, affectively and behaviourally communicate and peacefully interact with people from different culture.
GIS competency: the ability to understand geographic information systems; acquire and manage geo-referenced data; to make use of GIS technology
Citizen science competency: the ability to make use of citizen science tools; to acquire dataset from citizens
Project management competency: the ability to design, implement, assess and monitor project and programmes; to manage time efficiently; to manage and solve conflicts positively; to promote communication between different stakeholders.
Entrepreneurship competency: the ability to seek and identify opportunities for action; to propose and implement solutions to problems

2.6. Tangible experiences in Biosphere Reserves Higher Education programmes

There are in place some experiences of curricula dealing focused on MAB and Biosphere Reserves studies at Master level, at least two based in Europe, one starts in Africa (RDC) in 2021 :

- **Curriculum 'Man and Biosphere**' in the MSc Biodiversity, Ecology, Evolution at Université Paul Sabatier Toulouse (Toulouse, France)
  Lauched in 2016, the 60 ECTS MAB curriculum of the master 'Biodiversity, Ecology, Evolution' of the University Paul Sabatier of Toulouse aims "to provide concepts and tools to managers and leaders of territories and protected areas working in the spirit of the MAB program, 'Man and Biosphere' of UNESCO."

  Reference: https://www.univ-tlse3.fr/syllabus/SYL_M2_BEE-MAB.pdf [accessed: 7 September 2020]

- **MSc Biosphere Reserves Management** of the Biosphere Reserves Institute at the Eberswalde University for Sustainable Development (Eberswalde, Germany)

  Launched in 2020, the 120 ECTS program aims "to provide a coherent teaching of theoretical, methodological, and practical knowledge and skills in the management of biosphere reserves, so that graduates can implement and sustainably improve the UNESCO MAB (Man and Biosphere) Programme and its World Network of UNESCO Biosphere Reserves".

Reference: https://www.hnee.de/en/Research/Biosphere-Reserves-Institute/M.Sc.-Biosphere-Reserves-Management/M.Sc.-Biosphere-Reserves-Management-K6999.htm [Accessed: 7 September 2020]

- The professional **Master MAB** sur la Gestion des Réserves de Biosphère (GRB) is launched in 2021 in ERAIFT, Ecole Régionale Postuniversitaire d'Aménagement et de Gestion intégrés des Forêts et Territoires tropicaux (Kinshasa - Commune de Lemba - RD Congo), under the umbrella of UNESCO (as Categorie 2 center).

The fact that few programmes of MAB/BR higher education studies exist, reinforces the innovative character of a MSc on BRs that specifically focuses on the Mediterranean context and involves non-European organizations.

3. Building a Master Course on Mediterranean Biosphere Reserves: baseline

3.1. Introduction

In the following paragraph, a proposal for a Master Program on Mediterranean Biosphere Reserves is outlined. It underpins on the guiding principles set in the previous section of the document.

The proposal is to be considered 'ideal', i.e. a sort of guidelines that each Partner can adopt in the future according to the local resources, expertise and constraints at their own institution.

The proposal is based on the European Credit Transfer System (ECTS)[5], and contemplates two versions: one of 60 ECTS credits (1-year program) and the other of 120 ECTS credits (2-years program).

3.2. Aims and focus on the Mediterranean Region

The main aim of a Master Program on Mediterranean Biosphere Reserves should be to provide an interdisciplinary set of theoretical, methodological and practical knowledge and skills to train future professionals who will be involved both in the design, management, monitoring of and education

[5] https://ec.europa.eu/education/resources-and-tools/european-credit-transfer-and-accumulation-system-ects_en

and communication in Mediterranean Biosphere Reserves, under the auspices of the 'Man and Biosphere' program of UNESCO.

Taking into account that BR are testing places for applying SDGs and the three functions of a Biosphere Reserve (nature conservation, sustainable development of communities and logistic support for research and education); the guiding principles contained in the Lima Action Plan[6]; and the MedBR-ERM Agenda that was developed in the frame of Edu-BioMed[7], a MSc in Med-BRs should aim to provide the learner with:

- an understanding of the rapidly Global changing context, which implies societies should move quickly towards more sustainable socio-ecosystems;
- an understanding of biodiversity and landscapes as complex and dynamic products of human-nature relations;
- an understanding of the importance of bio/geo-diversity and dynamics, their preservation and restoration;
- an understanding of socioecological systems, socio-economic dynamics and processes that render the human development as (un-)sustainable;
- an understanding of principles, tools, mechanisms and structures for adaptive governance and management processes;
- an understanding of the role of education, scientific research, communication, cooperation, people involvement as key for a sustainable coexistence between humans and their environments.

The focus on Mediterranean region should be cross-cutting along the various modules composing the program (that are outlined in the following). It implies that case studies, facts and figures accompanying the theory should be always focusing on the Mediterranean context, regardless the nature of the discipline.

3.3. Proposals for the Academic Programs

3.3.1. Concept

Regardless of the number of credits, an MSc on Mediterranean Biosphere Reserves should be composed of three key elements:

1- A number of modules that would equip the learner with knowledge and understanding about:

[6] http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/SC/pdf/Lima_Action_Plan_en_final.pdf
[7] https://www.edubiomed.eu/wp-content/uploads/2019/11/MedBR-ERM-Agenda.pdf

- the socio-ecological premises that led to the adoption of the MAB Program by UNESCO, i.e. the global change scenario; And its realities in the Mediterranean Region, looking at its specificities
- the UNESCO Man and Biosphere Program (its legal-political frameworks and consequently Biosphere Reserves and the regional-thematic Networks);
- landscape interpretation (as socio-ecological system), design and management;
- biodiversity understanding (dynamics, monitoring),
- Biological (and geological) diversity conservation, management restoration;
- socio-economic sustainable development;
- governance mechanisms and/or environmental policy;
- environmental education, communication, and cooperation.
- project and research management

2- A consistent amount of credits dedicated to an empirical experience: internship in organizations that are dealing with Mediterranean BRs design, management, monitoring or education; or field work in Mediterranean BRs.

3- A consistent amount of credits dedicated to a theoretical-academic exercise of drafting a Master Thesis - preferably based on the internship or fieldwork- to be eventually further developed into a publication in academic journals or elsewhere.

In the following two paragraphs, the above-mentioned features are translated into a proposal of 120 or 60 ECTS program. The main items are similar, less developed in the 60 ECTS course.

3.3.2. A proposal for a two-years program

Module	(min) **ECTS Credits**
Global change issues in the Mediterranean region	6
Biodiversity knowledge, monitoring and representation.	3
Tools and mechanisms for Biodiversity management, conservation and restoration	6
The MAB program and Biosphere Reserves	6
Territorial participation and involvement issues and practices	6
Project and research management	6
Law, Policy, governance, Biosphere Reserves	6
Territorial Socio-economic development	6
Landscape interpretation, design and management (incl. GIS)	6
Intercultural environmental and sustainability education and communication, (incl citizen sciences)	6

Agroecology*	3
Ecotourism*	3
Internship or field work (3rd Semester)	30
Master Thesis (4th Semester)	30
TOTAL	**120**

(*) Optative

Annex I contains, for each course, some tips on its contents, learning objectives, pedagogy.

3.3.3. A proposal for a single-year program

Module	(min) **ECTS Credits**
Global change issues in the Mediterranean region	3
Biodiversity knowledge, monitoring and representation.	3
Tools and mechanisms for biosphere management, conservation and restoration	3
The MAB program and Biosphere Reserves	3
Territorial participation ad involvement issues and practices	3
Project and research management	6
Law, Policy, governance, Biosphere Reserves	6
Territorial Socio economic development	3
Landscape interpretation, design and management (*)	3
Intercultural environmental and sustainability education, communication *	3
Internship or field work (2nd Semester)	15
Master Thesis (2nd Semester)	15
TOTAL	**60**

(*) Optative

Annex I contains, for each course, some tips on its contents, learning objectives, pedagogy.

3.4. Target students: profile

Even if the proposed Master should open up as much as possible to students from a diverse range of backgrounds; given the technicality of some modules, it is recommendable to have applicants from Bachelor's programs with at least 24 ECTS on ecosystems/sustainable natural resource management or social-ecological systems research. This should include especially study programmes in the following fields:

- Sustainability sciences and studies;
- Agriculture and forestry, horticulture and agricultural or forest sciences;
- Ecology, Nature conservation, environmental sciences;
- Landscape ecology and interpretation;
- Environmental and spatial planning, landscape management and planning;
- Environmental, ecological or resource economics;
- Geography, geology, geo-ecology;
- Biology;
- Environmental education and communication.

Applicants with other degrees who have at least one year of relevant professional experience should be made also able to apply. Some materials (books…) will be proposed in their lacking fields.

4. Joint Master Degree on Mediterranean Biosphere Reserves: Feasibility Analysis

4.1. Introduction

As previously said, a specific objective of Edu-BioMed is to assess the feasibility of building a Joint Master between Partner HEIs.

The following sections analyze the baseline scenario and evaluate the opportunities and constraints for the implementation of such a Degree.

4.2. Opportunities and Constraints

4.2.1. The 'bricks': running Master programs at targeted HEIs

1) Master Degree in Interdisciplinary Studies in Environmental, Economic and Social Sustainability @Universitat Autònoma de Barcelona

2) Master Degree Program in Environmental Sciences @American University of Beirut

3) Master Sciences et Gestion de l'Environnement @Université Saint Joseph Beirut

4) Master Gouvernance des projets solidaires dans les territoires fragiles au Maroc et en Afrique sub-saharienne @Université Cadi Ayyad Marrakech

5) Master GouvAtdevGer - parcours 2 "Tourisme, patrimoine, gouvernance locale te développement des arrière-pays" TOURAP @ Université Mohammed V Rabat

4.2.2. Overlapping the ideal with the real: feasibility analysis

In order to understand whether with the current offer at each Partner university a Joint Master on MedBRs could be built, an assessment matrix was structured. Annex II contains the matrix at issue.

On the left column of the matrix, we find the list of modules that would compose the 'ideal' Master course that was outlined in Section 3. On the top row, we find first the running Master of reference at each Partner university (the ones outlined in the previous paragraph #4.2.1); second, on the right, a column is dedicated for each of the four semesters that would compose the full Joint Master. Hence, the matrix is composed by two parts: (i) on the left part the modules for the Joint Degree are matched with existing modules at the running programs at the various Partner universities; while (ii) the last four columns on the right serve the purpose of understanding possible mobility paths and calendar compatibilities.

The matrix shows us that:

1) In the modules of the partner Universities nothing is mentioned about the MAB Programme. This is in line with the outcomes of Work Package 1 of Edu-BioMed[8], and is a major shortcoming when it comes to build a Joint Master focused on MedBRs and MAB. This implies that for the module on 'MAB Program and Biosphere Reserve' no running courses fully respond to the specific objective of this teaching. In the matrix, the only courses that relate to Protected Areas ('Gestion des sites du patrimoine mondial' of the TOURAP Master and in the module 'Analysis and Management of Natural Landscapes' of UAB) are reported in red.

2) With the exception of the above mentioned course on MAB and BRs, all the remaining modules find coverage at the different universities (see the last four columns on the right of the matrix).

3) More than one mobility path is feasible (again, see the last four columns on the right of the matrix).

[8] See report for Task 1.1: https://www.edubiomed.eu/wp-content/uploads/2019/11/EduBioMed_Report-T1.1.pdf

4) The running modules are taught in both English and French. This issue should be taken into account as entry requirement or , eventually, through the insertion of a compulsory language course previous to the enrollment.

4.2.3. Internships and field works

Surely, students should be given the opportunity to spend their last month of Master in (or under the supervision of) an organization involved in BR management or research. The International Center for the Mediterranean Biosphere Reserves[9] should be taken as reference for networking purposes.

4.2.4. Lebanese - Moroccan systems: a private-public conflict of interests

The idea of building a joint Master program within the Edu-BioMed consortium is very difficult to implement given the nature of the institutions involved in the project, two public universities on the Moroccan side and private institutions on the Lebanese side. From one side, it would be difficult to set the amount of student's fees. From another point of view, while access to international funding schemes for Joint Master Degrees – like the Erasmus Mundus program – attracts Moroccan Partners, it is not in the interest of the Lebanese ones. In fact, these latters would not have a monetary incentive in hosting students with scholarships.

While Moroccan universities are free access institutions where students do not have to pay any fees, the Lebanese institutions are private and charge their students. This stands as a real obstacle for considering any type of cooperation between the institutions - for building a Joint Master Program and eventually apply to funding like the Erasmus Mundus program. Moroccan universities resort in building Joint Master Programs to the program Erasmus Mundus because it offers the possibility to provide funding for the students and faculty's mobility. The Lebanese institutions are, however, not interested in this type of program because they have no monetary incentive in hosting students with scholarships as they rely on the students' fees. From the Moroccan side, it is impossible for the students to pay fees to go to study in Lebanon as education is free in Morocco. Most Moroccan students who go to public universities are from very average or low -economic status and cannot afford to pay any fees. As public institutions, Moroccan universities cannot take any fees from the Lebanese students. Unless the Lebanese institutions accept to receive the Moroccan students for free in exchange of their own students who will pay the fees to their own institutions, there seems to be no solution to the issue and establishing a partnership seems impossible.

[9] Mail to: unescomedcenter@fundacioabertis.org

However, given the nature of this project and its value at the academic and social levels and its long term impact both locally and at the international level, and in order to exploit all the efforts made by the members of the team, it would be good to consider designing a flexible fee that would take into account the provenience and financial capacity of the potential applicants, as well as cover the costs of the Master.

ANNEX I - MSc Program Modules Description

Module title	Global change issues in the Mediterranean region
ECTS Credits	6
Learning Objectives	- Understanding of human impact on the environmental issues (land use changes, biodiversity erosion, global warming, pollutions) - Understanding of the major processes that affect the biosphere as well as connections and feedback loops - Understanding of geographical, ecological and human specificities of the countries around the Mediterranean - Understanding of the specific management issues of this "biodiversity hot spot" region, which is both a melting pot and a cultural, social and economic fault line. - Food for thoughts to respond meaningfully to the urgency of climate change and biodiversity loss
Contents	- Introduction to interrelationships among the natural environment, humans and the human environment, including the biological, social, economic, technological, and political aspects of current environmental challenges - The effects of global warming and the depletion of the ozone layer - The human threat to biodiversity and its consequences - Human impacts on environmental quality, including air and water pollution, agriculture, overpopulation, energy, and urbanization. - Human activities and land use changes.
Pedagogy	Interactive lectures to provide the scientific framework to understand environmental issues Seminars with discussion and debates Studies of documents and press, Meetings with managers of protected areas (e.g. wetlands and Mediterranean mountains) and elected representatives. Reading of contemporary environmental literature that center on the changing climate and biodiversity loss in the Anthropocene followed by presentations and debates, using a flipped classroom approach Reading of science fiction literature and debate

Module Title	Biodiversity knowledge, monitoring and representation
ECTS Credits	3
Learning Objectives	The management of the Biosphere Reserve is based on scientific knowledge and monitoring of biodiversity and local knowledge in order to propose actions adapted to the main issues and to share the information gathered at the local, national and international levels. The student will be able to assess biodiversity and the response of natural environments or species to anthropogenic pressures, use sampling techniques and strategies and plan or apply management measures.
Contents	The students will reflect on the strategies for acquiring knowledge in relation to the management issues of the territory: data to be collected according to the management problems, periodicity, scale, partnerships to be established (research laboratory, citizen sciences, etc.). Acquisition of environmental data, sampling and inventory strategies adapted to the organisms and environments studied, to material and financial contingencies according to scientific criteria, Environmental data management tools, including spatial and geo-referenced data, in particular Geographic Information Systems.
Pedagogy	Lectures by professionals Case studies

Module Title	Tools and mechanisms for biosphere management, conservation and restoration
ECTS Credits	6
Learning Objectives	Understanding of the issues and the effective means of protecting and restoring all the biodiversity compartments To get to know the basics of the management of spaces and species
Contents	Provide an overview of biodiversity conservation/management/restoration mechanisms with two main approaches: regulatory and contractual. This concerns protected areas and all mechanisms including biodiversity issues in the context of human activities: agriculture, forestry, fishing, urban planning, etc. Understanding of biodiversity and protected areas adaptive management. Management plans and strategy techniques and all participatory management processes for protected areas, ecosystems and territories. Understanding of land use planning principles and tools, including ecological corridors functionality and design

	Principles and practices to develop more ecological human activities as agroecology approaches Main principles and practices for species conservation and restoration
Pedagogy	Lectures Case studies Field trips, videos, meetings with managers and professionals

Module Title	The MAB program and Biosphere Reserves
ECTS Credits	3
Learning Objectives	Understanding the foundation, concepts and practices of MAB Program and Biosphere Reserves Get skills to understand socio ecological systems and integrated management of regions with both conservation and human development /well-being issues
Contents	History of nature conservation (actors, networks, approaches) and humans/nature relations (environmental ethics) - Socio-ecological systems, resilience and biodiversity conservation - Ecosystem services and biodiversity - From biosphere to ecological solidarity - UNESCO MAB Program Conservation approaches and their implementation - Protected areas in Mediterranean countries: status and reality - Portfolio of protection measures (acquisition, contract, certification, etc.) and planning of protected area systems Biosphere Reserve concept: history, evolution of BR concept, Seville strategy and statutory framework, legal and institutional aspects, world network, governance, best practices...
Pedagogy	Interactive lectures and debates, examples (videos analysis…) Serious games Students personal research and oral/written presentations

Module Title	Territorial participation and involvement issues and practices
ECTS Credits	6

Learning Objectives	A Biosphere Reserve manager leads the elaboration and implementation of a territorial sustainable development project. A number of socio-economic stakeholders, with various and sometimes contradictory expectations and practices, are involved in this development. It is therefore essential to involve them in each of the project's development and implementation phases. This implies to have the skills to animate a multi-stakeholder process and to know how to use tools to co-build the territorial project. The student are trained in two stages: one on the analysis of the context, the other on the construction of a shared vision with local stakeholders. They will learn to : - characterize a socio-environmental context, - analyze the stakeholders system, - identify participation issues, choose adapted methodology and tools, identify limits for participatory approaches, - carry out participatory territorial diagnoses - practice participatory methods, - manage conflicts and ensure mediation. - Spatialize and classify issues for BR zonation,
Contents	- Modalities of collective action - Participatory approaches and conflict management: concepts and practices - Strategic analysis of actors in organizations sociology - Institutional analysis of common resource management - Analysis of socio-technical controversies - Analysis of a socio - ecological system: participatory diagnosis - From the origins of participation to the diversity of current participatory approaches - - Deepening of a prospective approach: integrated evaluation of scenarios
Pedagogy	Interactive lectures and debates Case studies on real issues Serious games Workshops

Module Title	Project and research management
ECTS Credits	6
Learning Objectives	Learn project management approaches for territorial sustainable development

Contents	- Project engineering - Characterization of a situation, strategic approach, clarification of the problem to be addressed - Iterative design process, management of environmental project - Management and scheduling, monitoring and control tools - Adaptive management - Participatory diagnosis - Controversy analysis - Foresight
Pedagogy	Putting the theory into practice with a real life project proposed by a Biosphere Reserve

Module Title	Law, Policy, governance in Biosphere reserves
ECTS Credits	6
Learning Objectives	
Contents	Understanding of the main issues of governance at regional level Getting familiar with the most common governance options in BR
Pedagogy	Lectures Case studies Serious game

Module Title	Territorial Socio economic development
ECTS Credits	6
Learning Objectives	Understand the principles and practices of ecological economics in BRs
Contents	Circular economy and territorial ecology Social economy Biosphere reserves charters, networking ambassadors and eco-players Labels and certifications
Pedagogy	Lecture Case studies

Module Title	Landscape interpretation, design and management (incl GIS)
ECTS Credits	6

Learning Objectives	- Theoretical and practical knowledge of GIS applications, spatial data sources and data management issues; - Working competence of the ArcGIS and QGIS softwares; - Ability to use environmental data and GIS tools to support environmental and socio-economic studies, for biodiversity management or/and planning; - Understanding the relationship between spatial analysis and report writing
Contents	- Presentation and practical application of geomatics tools - Use of Geographic Information System softwares - Discovery of relational database management system
Pedagogy	Interactive lectures; Class projects on lab computers based on case studies in connection with the module "Physical-human geography of the Mediterranean region".

Module Title	Intercultural environmental and sustainability education, communication
ECTS Credits	6
Learning Objectives	To provide students with an understanding of principles, values and practices of ESD: transversality, personal involvement, learning by doing, contact and connection with nature, interpersonal and intercultural open dialogue To provide students with the basics to deliver a technical message to different publics, using different medias To understand the major issues and steps of communication: Defining targets, clarifying messages
Contents	ESD: • Principles • Practice ESD in a BR: building partnerships with schools and others publics • Case studies Communication: • To analyze the public targeted • To write an internship report • Oral presentations with illustrations related to professional experiences • Design of communication materials for different audiences
Pedagogy	Interactive lectures

	Case studies Create a leaflet, an exhibition or a web page for a BR

Module Title	Agroecology
ECTS Credits	3
Learning Objectives	To understand the expectations and the main characteristics and practices of agroecology, in order to be able to promote them and accompany the agricultural mutation of various stakeholders
Contents	Definitions, practices, position in national and international policies Agroecological diagnoses Organizational and participatory issues to reorganize producing - feeding systems at the regional level
Pedagogy	Interactive lectures and debates Case studies, field trips, meetings with practioners

Module Title	Ecotourism
ECTS Credits	3
Learning Objectives	To understand definitions, practices, position in national and international policies Territorial ecotourism diagnoses Tools and methods to match criteria of the European charter for sustainable tourism
Pedagogy	Interactive lectures and debates Case studies, field trips, meetings with practionners

ANNEX II – Matrix for Joint Master feasibility analysis

EduBioMed

Module New Master	Matching with Master Degree in Interdisciplinary Studies in Environmental, Economic and Social Sustainability _**Universitat Autonoma Barcelona (UAB)**	Matching with Master Degree Program in Environmental Sciences _**American University of Beirut (AUB)**	Matching with Master Sciences et Gestion de l'Environnement _**Université Saint Joseph Beirut (USJ)**	Matching with Master Gouvernance des projets solidaires dans les territoires fragiles au Maroc et en Afrique sub-saharienne _**Université Cadi Ayyad Marrakech (UCA)**	Matching with Master GouvAtdevGer - parcours 2 "Tourisme, patrimoine, gouvernance locale te développement des arrière-pays" TOURAP _**Université Mohammed V Rabat (UM5)**	1st Semester (Autumn)	2nd Semester (Spring)	3rd Semester (Autumn)	4th Semester (Spring)
Global Change issues in the Mediterranean region - 6 ECTS	Global Change - 9 ECTS	**1**_ Climate Change and Water Resources - 3 Credits **2**_ Environmental Impact Assessment - 3 Credits				**UAB** (English) / **AUB:**(English) both modules Fall or Spring	**AUB:** (English) both modules Fall or Spring		
Biodiversity knowledge, monitoring and representation - 3 ECTS	Biocultural Diversity - 6 ECTS		**1** Conservation de la biodiversité des gènes à l'écosystème - 4 Credits **2** Ecosystème terrestre et marin - 4 Credits **3** Traitement et Analyse de Données - 6 Credits			**UAB** (principal working language English - Readings will be in English and Spanish) **USJ: 1, 2 & 3** (French)			
Tools and mechanisms for Biodiversity management, conservation and restoration - 6 ECTS	Analysis and Management of Natural Landscapes - 6 ECTS	**1**_ Environmental Management Systems - 3 Credits (Alternate Year) **2**_ Directed Study in Ecosystem Management - 3 Credits	**1** Gestion environnementale des entreprises et des collectivités - 3 Credits **2** Politiques environnementales (stratégies) -3 Credits	Management stratégique des écosystèmes territoriaux - ECTS N/A	Gestion des sites du patrimoine mondial (parcours professionnel) - ECTS N/A	**UAB:** English **AUB: 1 & 2** (English) Fall or Spring	**AUB: 1 & 2** (English) Fall or Spring	**USJ: 1 & 2** (French) **UCA:** (French) **UM5:** (French)	
The MAB program and Biosphere Reserves - 6 ECTS	Analysis and Management of Natural Landscapes - 6 ECTS				Gestion des sites du patrimoine mondial (parcours professionnel) - ECTS N/A	**UAB:** English		**UM5:** (French)	
Territorial participation and involvement issues and practices - 6 ECTS				**1**_ Acteurs, Ressources et Territoires des Suds - ECTS N/A **2**_ Politiques Publiques et gouvernance locale - ECTS N/A **3**_ Collectivités territoriales, décentralisation et aménagement des territoires - ECTS N/A	Régionalisation et gouvernance des territoires et de l'environnement - ECTS N/A	**UCA: 1 & 2** (French) **UM5:** (French)	**UCA:3** (French)		
Project and research management - 6 ECTS			Project management - 4 Credits	Gestion, suivi et évaluation des projets de l'économie sociale et solidaire - ECTS N/A	Ingénierie de projet, montage de produit de tourisme rural. ECTS N/A		**USJ**: (French)	**UCA**: (French) **UM5:** (French)	
Law, Policy, governance, Biosphere Reserves - 6 ECTS	Corporate Social Responsibility - 6 ECTS	Development and Planning Policies - 3 Credits	Droit et législation - 2 Credits	Gouvernance et développement territorial - ECTS N/A	Cadre juridique et institutionnel de l'aménagement et du développement durable des territoires et des ressources - ECTS N/A	**UAB** (English) **AUB** fall or spring (English) **USJ** (French)	**AUB** fall or spring (English) **UCA** (French) **UM5** (French)		
Territorial Socio-economic development - 6 ECTS	Foundations of Ecological Economics - 9 ECTS	Resource and Environmental Economics - 3 Credits	Economie de l'environnement - 2 Credits	Economie sociale et solidaire -ECTS N/A	Patrimoine, patrimonialisation et développement local et régional - ECTS N/A	**UAB** (English) **USJ** (French) **UCA** (French)	**AUB**: (English) **USJ** (French) **UM5** : (French)		
Landscape interpretation, design and management (incl. GIS) - 6 ECTS	**1** Analysis and Management of Natural Landscapes - 6 ECTS **2** Geographic Information System - 6 ECTS		Le SIG (système d'information géographique) - 3 Credits	SIG et analyse spatiale des informations ECTS N/A	**1**_ Les bases géographiques de l'aménagement et du développement durable des territoires - ECTS N/A **2**_ Expression graphique et cartographique - ECTS N/A	**UAB 1 &2** (English) **UM5: 2** (French) **UCA** (French)	**UM5:1** (French) **USJ** (French)		
Intercultural environmental and sustainability education and communication, (incl citizen sciences) - 6 ECTS		Population and Community Ecology - 3 Credits	**1** Etude d'impact - 4 Credits **2** Communication - 4 Credits		**1**_ Organismes Non Gouvernementaux (ONG), Valorisation des ressources et développement durable des territoires. ECTS N/A **2**_ Langues et communication - ECTS N/A	**AUB:** (English) **USJ: 2** (French) **UM5: 2** (French)	**UM5: 1** (French&English)	**USJ: 1** (French)	
Agroecology * - 3 ECTS			**1** Pollutions : urbaine, industrielle et agricole - 2 Credits **2** Environnement et santé - 2 Credits		Systèmes agraires, patrimoine rural et gestion des territoires touristiques - ECTS N/A	**USJ: 1** (French)		**UM5:** (French) **USJ: 2** (French)	
Ecotourism * - 3 ECTS					Le MOOC (Massive Open Online Course) appliqué à l'éco-tourisme et aménagement de l'espace - ECTS N/A		**UM5**: French		
TOTAL 120 ECTS									

Legend
(*) Optative