EduBioMed

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

REPORT FROM TASK 1.2
Assessment of territorial needs and demands

UAB Universitat Autònoma de Barcelona
Aix*Marseille université initiative d'excellence
AUB American University of Beirut
USJ 1875
MARRAKECH UNIVERSITÉ CADI AYYAD
Université Mohammed V de Rabat
Réserves de BIOSPHERE MAB FRANCE
JABAL MOUSSA
unimed

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About EduBioMed

The project aims to strengthen, ameliorate 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.

Partners:

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

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Document Information

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Abstract (for dissemination)	The present document reports on activities performed in the frame of Task 1.1 of the EduBioMed project

Document History

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Table of contents

1. Introduction

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, ameliorate 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, which aim is to explore solutions for the improvement or relationships between people and their environments on a multidisciplinary scientific basis.

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.

¨Edu-BioMed aim is to strengthen, ameliorate 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¨

1.1. The Task 1.2 of the Edu-BioMed project

The strengthening of relations between targeted HEIs and BRs stakeholders is one among the specific objectives of Edu-BioMed. There is the recognition of a disconnection between academic activity and BRs reality.

[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

¨The main objective is to assess local BR stakeholder´s needs and the main problematic of the territories, so to orient the academic activity at targeted universities¨

Therefore, it emerges the need to orient education and research towards territorial needs and demands, which ultimately benefit society. Vice-versa, BRs can provide HEIs with meaningful case studies, sources of knowledge(s), and training opportunities for learners. From one side, a dialogue between BRs and HEIs staff would foster the fruitful sharing of experiences towards the implementation of good practices. From another point of view, it is proven that the involvement of local communities is key to a successful BR. HEIs can facilitate the involvement of citizens in knowledge making towards a democratic governance of the territories.

Within the various activities in Edu-BioMed, Task 1.2 consisted in the assessment of local BR stakeholder´s needs and the main problematic of the territories, that could orient the future academic activity (applied research, training and education) at targeted HEIs. In order to pursue the aim, representatives from local communities, NGOs and public institutions were consulted in the four BRs (*Figure 1*) that constitute the object of study of Edu-BioMed: Jabal Moussa BR (JMBR, Lebanon), Shouf BR (SBR, Lebanon), Arganaraie BR (RBA, Morocco) and the Intercontinental BR of Mediterranean (RBIM, Morocco-Spain). The present document report on the results from the assessment.

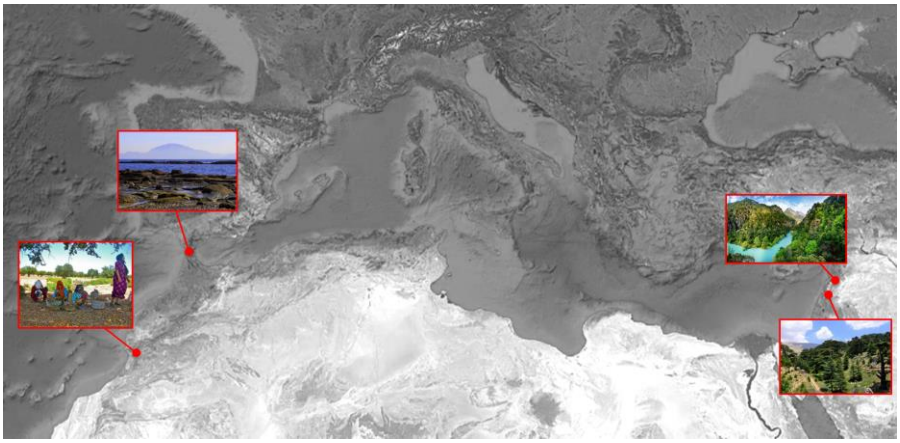

Figure 1. Study locations. From right to left, up to down: Intercontinental BR of Mediterranean (RBIM, Morocco-Spain); Jabal Moussa BR (JMBR, Lebanon); Arganaraie BR (RBA, Morocco); Shouf BR (SBR, Lebanon)

1.2. The four targeted Biosphere Reserves

Table 1 to Table 4 contain figures of the four study regions[4].

[4] *Source: Flamme et al., The Mediterranean Biosphere Reserves Network. The International. International Center for the Mediterranean Biosphere Reserves & Fundació Abertis. Editorial Planeta. Under printing*

Jabal Moussa Biosphere Reserve, Lebanon			
Total surface	6.500 ha	**Core area**	1.250 ha (19%)
		Buffer zone	1.700 ha (26%)
		Transition area	3.550 ha (55%)
Location	The Jabal Moussa Biosphere Reserve is located in the Kesrouan district, 50 km from the country's capital, Beirut, and dominated by the rivers of Nahr Ibrahim to the north and Nahr el-Dahab to the south.		
Biogeographic region	East Mediterranean		
Administrative division	The main towns/villages in the JMBR are: Qehmez – Nahr el-Dahab/Mchati - Yahchouch - Ghbeleh - Al iibre- Chouwan- Jouret et-termos.		
Population	Approximately 8,500 inhabitants.		
Declaration date	2009		
Other protection figures	Protected Forest (2008, by the Ministry of Agriculture), globally Important Bird Area (2009, BirdLife International), Natural Area (2012, by the Ministry of the Environment), Roman Stairs – Historic Site (2012, Directorate-General for Antiquities – Ministry of Culture).		
Human activities	Ecotourism, mining, traditional agriculture, pasture, cutting and collection of medicinal and aromatic plants and recreational activities.		
Description	The dominant characteristics of the Reserve are its karstic substrate and the presence of three bioclimatic regions: Euro-Mediterranean, supramediterranean and Mediterranean mountain. It is one of the most outstanding areas in the Middle East in terms of the richness and diversity of the forest landscape, which is home to a great variety of native flora and fauna. In the protected area, scientific research and ecotourism activities are carried out, in the buffer zone human activities are practised such as logging and the collection of medicinal and aromatic plants, and the transition zone is used for traditional agriculture, grazing and recreational activities. Products under the Jabal Moussa brand are produced in the reserve and are basically jams, vinegars, juices, herbs and other products such as tomato paste.		
Managing body	NGO-Association for the Protection of Jabal Moussa (APJM)		
Contact	Mr Pierre Doumet, President of APJM: pierre.doumet@jabalmoussa.org Joelle Barakat - Head of Conservation at APJM joelle.barakat@jabalmoussa.org Ms Christelle About Chabke - Head of Communication and Ecotourism at the APJM - christelle.ach@jabalmoussa.org		

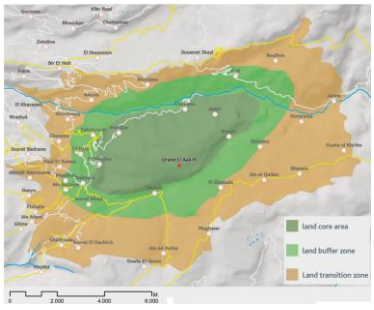

Table 1. Characterization of Jabal Moussa BR, Lebanon

***Shouf* Biosphere Reserve, Lebanon**			
Total surface	55.900 ha (100%)	**Core area**	11.500 ha (20%)
		Buffer zone	6.500 ha (12%)
		Transition area	37.900 ha (68%)
Location	Lebanon Western Mountain Range		
Biogeographic region	East Mediterranean		
Administrative division	22 municipalities in the Shouf and West Bekaa		
Population	Approximately 116.000 inhabitants.		
Declaration date	2005		
Other protection figures	The Shouf Nature Cedar Reserve, Ammiq Wetland Ramsar Site, 22 villages surrounding the reserve.		
Human activities	Forestry, agriculture, harvesting wild plants, grazing, eco-tourism (managing guest houses and tables d'hôte), hiking		
Description	The Shouf Biosphere Reserve covers 5% of the area of Lebanon, has 620 hectares of Cedrus libani forests, and a rich cultural heritage. It is home to a very large number of flora and fauna species, some being endemic and others threatened. It has become a center for scientific research by adopting Forest Landscape Restoration. It has led the first reintroduction of an extinct species in Lebanon. It supports the development of the local communities through agriculture and ecotourism programs.		
Managing body	Al Shouf Cedar Society (ACS) member of Appointed Protected Area Committee (APAC), under the authority of the Ministry of Environment (MOE) http://shoufcedar.org/		
Contact	Mr Nizar Hani, President of ACS: nizar@shoufcedar.org		

Table 2. Characterization of Shouf BR, Lebanon

Arganaraie Biosphere Reserve, Morocco			
Total surface	2.449.970 ha (100%)	**Core area**	16.620 ha (1%)
		Buffer zone	582.450 ha (23%)
		Transition area	1.900.900 ha (76%)
Location	Located in the southwest of Morocco, this BR covers a vast intramontane plain bordered by the High Atlas and Anti-Atlas Mountains and open to the Atlantic Ocean in the west.		
Biogeographic region	Mediterranean – Saharan transition		
Administrative division	The Souss Massa Region constitutes 74% of the RBA's surface, whereas the Marrakech-Safi Region stands for an 18% and the Guelmim-Oued Noun Region for the remaining 8%. The main cities and towns are Agadir, Taroudant, Tiznit and Essaouira.		
Population	3,121,116 inhabitants (2014)		
Declaration date	8th December 1998		
Other protection figures	National Park of Souss Massa SIBEs (Biological and Ecological Interest Sites): Ain Asmama, Tamri-Cap Ghir, Jbel Amsittene, Dunes of Essaouira, Admine, Assads, Tafingoult, Anezi, Ait er Kha, Bou Timesguida, Dar Lahoussine, Jbel Kest, Tifnout.UNESCO Intangible Cultural Heritage (2014)		
Human activities	Seaside and rural tourism, crafts, fishing, modern agriculture of citrus and horticulture, traditional agriculture, manufacture of Argan oil and medicinal and aromatic plants -WFP-, farming, mining, services and environmental education.		
Description	The Reserve takes its name from Morocco's majestic endemic tree, the argan (*Argania spinosa*). It hosts an exceptional ecosystem with a diversity of species in a unique territory, with a great biogeographic value that extends from the Atlantic coast to the summits of the Western High Atlas to the Anti-Atlas. The argan tree is a symbol of a strong ancestral relationship between the local population and nature, linked to an original know-how exclusive of women and recognized as Intangible Cultural Heritage.		
Managing bodies	Direction Régionale des Eaux et Forêts et de la Lutte Contre la Désertification (DREFLCD-SO) Department of Water and Forest, Ministry of Agriculture http://www.eauxetforets.gov.ma/ Agence Nationale pour le Développement des Zones Oasiennes t de l´Arganier (ANDZOA) http://andzoa.ma/fr/		
Contact	Mr Abdelaziz Afkir (DREFLCD) afkaziz3@gmail.com Mr Mohammed Bachri (ANDZOA) bachri.andzoa@gmail.com		

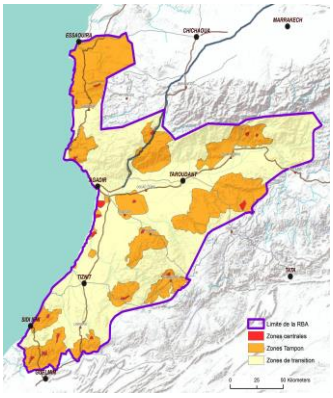

Table 3. Characterization of Arganaraie BR, Morocco

Intercontinental Biosphere Reserve *of the Mediterranean*, Morocco-Spain			
Total surface	907.185 ha (100%, 470.600 in Morocco and 423.535 in Spain, 13.050 ha of water corridor)	**Core area**	44.707 ha (5%)
		Buffer zone	742.132 ha (83%)
		Transition area	107.296 ha (12%)
Location	The RBIM is located at the western end of the Mediterranean Sea, right at the nexus with the Atlantic Ocean and where Europe and Africa are separated by the narrow 14 kilometres of the Strait of Gibraltar.		
Biogeographic region	Mediterranean		
Administrative division	108 municipalities, 63 in Andalucia, distributed between its Cadiz and Malaga provinces, while the Moroccan 45 are divided into Chefchaouen, Larache, Ouzzane, Tánger and Tetuán provinces.		
Population	529.086 inhabitants, 126.859 in Spain 402.227 in Morocco.		
Declaration date	27th October, 2006		
Other protection figures	In Spain: 4 Natural Parks, 4 Natural Sites, 3 Natural Monuments, 1 Peri-urban Parks, 7 Zonas de Especial Protección para las Aves (ZEPA), 19 Zonas de Especial Conservación (ZEC) and 2 Biosphere Reserves. In Morocco: 1 Natural Park y 6 Sitios de Interés Biológico y Ecológico (SIBE).		
Human activities	The Reserve preserves a wide range of traditional human activities such as agriculture, fishing, livestock and the use of forest resources, which share the limelight with new activities such as tourism.		
Description	This intercontinental reserve, unique in the world, has its essence in its transboundary character, which allows constant flows that favour its high biodiversity and the specificity of its ecosystems. Historically, constant exchanges have materialized their own cultural forms, such as the internationally recognized Andalusian. And, socially, its current differences and convergences make it a privileged scenario to work for sustainable development.		
Managing bodies	From the Moroccan side, the Direction Régionale des Eaux et Forêts et de la Lutte Contre la Désertification (DREFLCD-SO) Department of Water and Forest, Ministry of Agriculture. http://www.eauxetforets.gov.ma/ From the Spanish side, the Ministry for Ecological Transition (Kingdom of Spain) and the Department of Agriculture, Livestock, Fisheries and Sustainable Development of the Regional Government of Andalusia (Kingdom of Spain). http://www.juntadeandalucia.es/medioambiente/site/portalweb		
Contact	Mr Mchich Derak (Morocco) mchich78@hotmail.com Ms Milagros Perez Villalba (Junta de Andalucia) milagros.perez.villalba@juntadeandalucia.es		

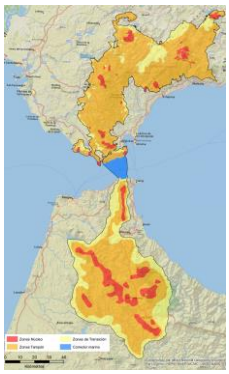

Table 4. Characterization of Intercontinental BR of the Mediterranean, Morocco-Spain

1.3. Work teams

This document is the product of the coordination efforts between several professionals from the HEIs and BRs partnering the Edu-BioMed project.

Professor Magda Bou Dagher (USJ) is the Task leader, and together with Ms Eliane Bou Dagher coordinated the activities and conducted the assessment in Lebanese BRs, with the support of APJM (Pierre Doumet, Joelle Barakat, and Christelle Abou Chabke, respectively the President, Head of Conservation and Head of Communication and Ecotourism at the APJM) and SBR (Nizar Hani) managers.

In the Moroccan RBA, a focus group was moderated by Professor Said Boujrouf (Director of LERMA and former Director of the Geography Department at UCA) with the support of two PhD students; while other two were performed in RBA by Mrs. Mari Carmen Romera, a UAB doctoral student who is conducting her research on the governance of the same BR, with the support of Mr Antonio Bontempi, UAB´s Edu-BioMed project manager.

Finally, in RBIM the work has been led by Mr. Mohamed Aderghal, Professor of Geography at FLSH-UM5 in Rabat and Director of the Laboratory of Engineering for Tourism, Heritage and Sustainable Development of the Territories (LITOPAD). Mr Bruno Romagny and Jean-Marc Lange from AMU facilitated the activities.

2. Methodology

2.1. Approach

By the time of the project Kick-Off meeting at Castellet Castle in December 2018, the idea was to apply the same methodology for the four BRs. After a first contact with BR management bodies, a snowball sampling methodology would allow the selection of participants for the conduction of focus groups.

At the beginning of the focus groups, after welcoming the participants and presenting the Edu-BioMed Erasmus+ project, it would be explained that "Biosphere Reserve" (RB) is a UNESCO label after the intergovernmental scientific programme "Man and the Biosphere" (MaB). Starting from the difference between a nature reserve and a BR, the aim would be to point out to the participants that their role in the BR (and Edu-BioMed) is of great importance.

The questionnaire projected via video projector throughout the focus groups, alternates open, closed, semi-open and comparative questions in order to investigate the domain of study.
The construction of the questionnaire was organized around three approaches:

a) A cognitive approach: highlighting the knowledge and habits of local communities with regard to the BR.
b) An emotional approach: highlighting what communities like and dislike about their BR. Results rely on their attitudes and motivations.
c) A projective/prospective approach: determination of stakeholders´ expectations and needs in terms of activities and projects.

¨After a first contact with BR management bodies, a snowball sampling methodology would allow the selection of participants for the conduction of focus groups. ¨

The interviews would structure so that the facilitator ask questions and guide the discussions in a neutral manner so as not to influence the individuals' responses. In each of the sessions PhD students would be involved as observers, writing down participants' answers, making it easier for the facilitator to follow the exchanges.

Focus groups are qualitative studies and only a content treatment can provide an overview of the results. Following the meetings, an individualized transcription of the participants' words and non-verbal aspects was carried out. The information collected is essentially qualitative. Its treatment was carried out in the traditional way: by identifying key themes, cross-referencing stakeholders' statements in relation to each theme. Many topics emerged from the discussion. Some of the concerns that were raised are relevant and consistent with the project objectives, some others are not. A selection of respondents´ demands, suggestions, concerns, needs was made, so to be consistent with the Task objectives (see section 3. Outcomes).

However, given the differences between territorial realities, time constraints and the grand number of stakeholders at play, each work team choose to apply variants of such methodology, so to strategically meet the objective. Such peculiarities are described in the following

2.2. *Jabal Moussa* BR, Lebanon

A snowball sampling methodology permitted to select participants. Exploiting the JMBR network of contacts, the access to the focus group was opened to people from various parts of the Reserve. The practice allowed to gather 45 participants, including 17 women (12 adults and 5 youths) and 28 men (24 adults and 4 youths). In order to collect the most complete information possible on the BR reality, they made sure that the focus groups brought together people from different backgrounds. The individuals who participated in the focus groups came from the municipalities of Qehmez, Mchati, Chouwan, Ghbeleh and Jouret el Termos; the first one located in the transition zone, the rest in the buffer one (Figure 2).

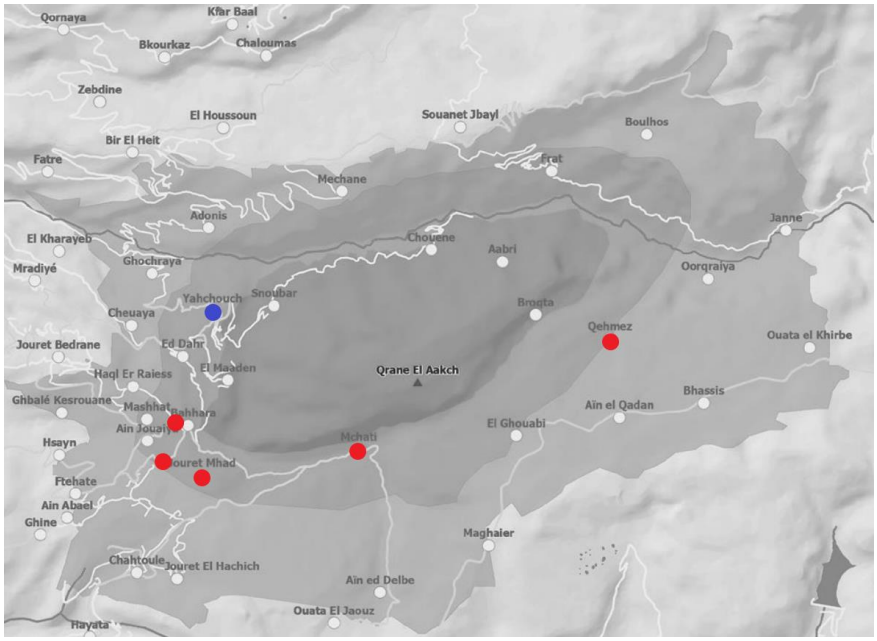

Figure 2. Location of provenience of participants (in red) and of the focus group (in blue) in Jabal Moussa BR

Focus groups with local communities of the Jabal Moussa Biosphere Reserve (JMBR) took place on Saturday 16th of March and Wednesday 25th of April 2019 at بيت الضيعة - a traditional Lebanese house restored by the municipality of Yahchouch, in the caza of Kesrouan in Mount Lebanon (34° 04' 00'' north, 35° 44' 11'' east, Figure 2). The location was designated by JMBR managers. This approach was strategic because, by meeting individuals in places they are familiar with, the investigation process was conducted in an atmosphere that favoured the sharing of information. The presence of APJM staff encouraged people to participate and find ways to get involved with them.

Telephone calls proved to be an alternative way of collecting the comments of individuals who were absent during the focus groups.

The results obtained also allow the identification of stakeholder groups and their behavioural characteristics. This study puts the basis of a socio-economic survey that JMBR managers intended to conduct among local communities, and as an update of a survey already conducted in October 2009 by the Department of Sociology and Anthropology at the Faculty of Letters and Human Sciences of the USJ[5].

[5] Abi Habib-Khoury, R. (2009), *Socio-Economic Survey in the Jabal Moussa Region*, Research report of the Sociology laboratory- Department of Sociology and Anthropology, in collaboration with the University Observatory of Socio-Economic Reality at USJ.

2.3. *Shouf* BR, Lebanon

The head of Al Shouf Cedar Society (ACS), Mr Nizar Hani, was contacted right after the Edu-BioMed kick-off meeting (December 2018). He explained that discussion workshops had recently been held in SBR to a similar purpose, i.e. to assess local stakeholders´ needs and demands.

In May 2018, the SBR submitted an application for inclusion in the IUCN Green List (a joint initiative of the World Commission on Protected Areas (WCPA) and the IUCN World Programme for Protected Areas (GPAP)). In July 2018, SBR entered the first phase of the evaluations required by IUCN, resulting in a series of meetings with stakeholders. We have therefore obtained permission to use the raw data collected for the Green List in the frame of Edu-BioMed project.

Figure 3. Pictures from the focus groups in JMBR

ACS conducted a questionnaire survey of local communities to collect their representations of a Biosphere Reserve in general and that of the SBR in particular. Letters were sent to municipalities to seek their views and comments on the relationship with the RBS. Three workshops were then held: a first to introduce the Green List project, a second workshop using the World Café technique and a final workshop at the end of 2018. In the frame of the Edu-BioMed project, we take advantage of the workshop held on 10 September 2018 in Maasser El

Shouf[6] to meet with stakeholders of the Shouf Biosphere Reserve (SBR) and obtain their point of view.

This "World Café" consisted of having four tables with a SBR facilitator to ask questions and take notes. Each group of 5 to 6 participants went to a table to discuss only two questions. After the scheduled time, they moved to another table where they were informed of the previous group's discussions. The four SBR facilitators finally presented the results of each table to all participants. The first table addressed the issue of on reserve management, the equitable protection of private property and BR governance. The second table addressed the issue of environmental protection. The third table addressed the issue of communication and participation in the reserve's programs and activities. At the fourth table, participants were asked whether the reservation gave them the opportunity to express their views at meetings, seminars, workshops and visits and whether they had already reported any conflicts or objections.

2.4. *Arganaraie* BR, Morocco

In RBA, the assessment was conducted at two levels: at the community level and the administrative level, with two different groups of interviewed.

On April 8th, 2019, Ms. Mari Carmen Romera and Mr. Antonio Bontempi (UAB) gathered representatives of local communities and enterprises in Tisskji, a village in the High Atlas Mountains, Imouzzer region. A representative of the High Commissioner for Water and Forests and the Fight against Desertification (HCEFLD, Mr. Abdelaziz Afker) assisted in the translation from Amazigh to French. No pictures could be taken, due to local culture constraints.

From the other side, two different focus groups were organized with RBA experts in the city of Agadir, both on April 10th and 17th, 2019, at the HCEFLD headquarters. Prof. Said Boujrouf (UCA), Ms Mari Carmen Romera and Mr. Antonio Bontempi (UAB), with the support of two PhD students from UCA, organized and conducted the activities. Several professional from the private, public and academic sectors who know the RBA from different specializations were consulted in the two sessions (Figure 4, Figure 5).

The questions to be addressed to both groups covered three major areas: knowledge of a Biosphere Reserve and the Moroccan Argan tree; university research and collaboration with the RBA; and the role played/to be played by the university and its research centres in meeting

[6] HANI, N. & al. (2018). Report of the IUCN Green List workshops : Stakeholders analysis in the Shouf Biosphere Reserve. Maasser El Shouf : Lebanon.

the needs and demands of the population. Within the same category, the set of questions aims to solicit more participants and identify obstacles that hinder the synchronization of initiatives between RBA, HEIs and the local population. A classification by category made it possible to better process the responses collected.

Figure 4. Pictures from the 10th April's focus groups. In the first picture, from left to right: Abdelaziz Afker (HCEFLCD-SO Partnership Service, RBA Manager); Mari Carmen Romera (PhD candidate at ICTA-UAB); Aissa Mokadem (Head of HCEFLCD-SO Partnership Service); Antonio Bontempi (Edu-BioMed project manager at UAB); Mina Ait El Moudden (REFAM Project); Miloud Azarhoun (RARBA President); Khadija El Mamoun (RDTR Director); Ahmed Achour (DREFLCD-SO Studies Service); Farid Ouidder (GIZ), Mohamed Handaine (ICCA Consortium); Abdelrahman Ait Lhaj (Research Officer, ANDZOA) and Ahmed Tantim (Circular Economy Project and Imouzzer Ida Ou Tanane Local Development Officer - UNDP)

Figure 5. Pictures from the 17th April's focus groups with Prof. Said Boujrouf (UCA). Attendants: Mr Abderrhamane AIT LHAJ (Professor, Head of department at ANDZOA) ; Mr Abdelaziz AFKER (HCEFLCD-SO Partnership Service, RBA Manager); Mr Aderdar Mohamed (Professeur at IBN ZOHR University, Agadir); Mr Ziyadi Mohamed : Professor at UCA, Safi); Malika Ait Nasser (professor at IBN ZOHR University); Samira Ghoulane (University IBN ZOHR, Agadir); Hala IDRASSEN (PhD student at UCA) ; Salma El GHIIOUAN (PhD student at UCA)

Besides collecting the responses from focus group participants, and codifying them into main topics, UCA team performed a lexicometry analysis by means of the Iramuteq[7] Software for Multidimensional Text and Questionnaire Analysis, which reproduces the classification method

[7] Iramuteq est un logiciel libre distribué sous les termes de la licence GNU GPL (v2). Il permet de faire des analyses statistiques sur des corpus texte et sur des tableaux individus/caractères. Il repose sur le logiciel R (www.r-project.org) et le langage python (www.python.org).

described by Reinert[8] and reports on the internal organization of the speech of focus group participants Figure 6.

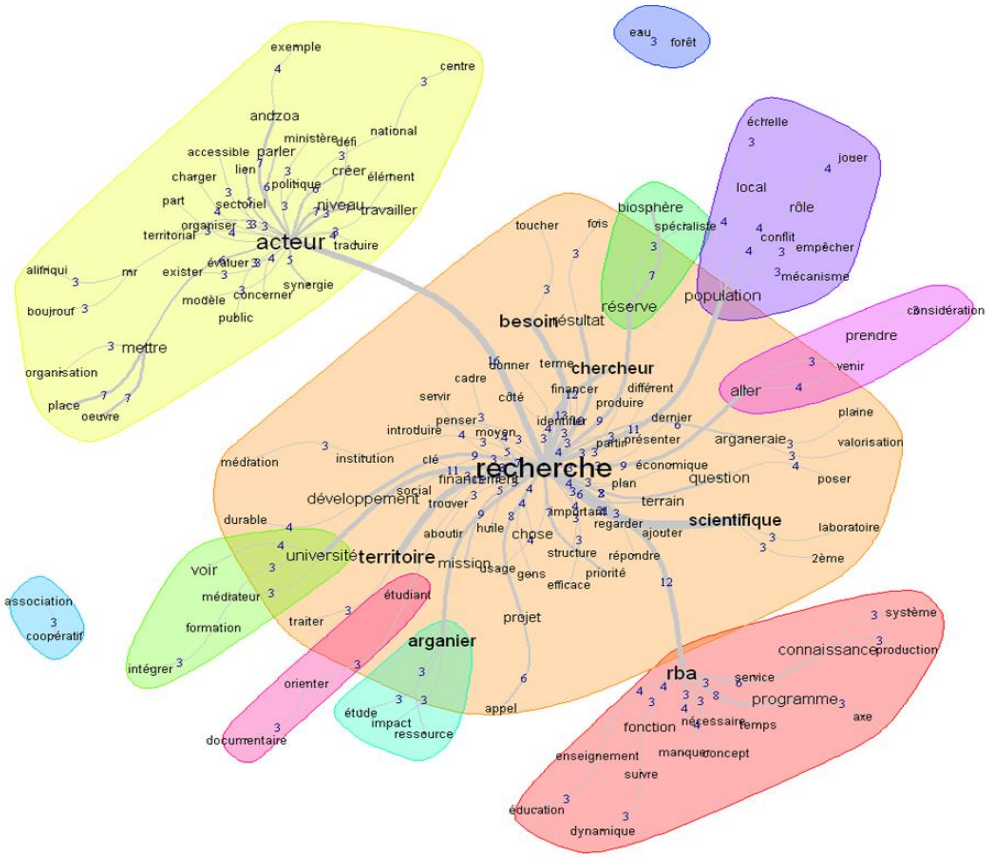

Figure 6. Results from the lexicometry analysis – UCA focus group in RBA

2.5. RBIM, Morocco-Spain

Three focus groups were organized so to collect perspectives from different stakeholders from the Chefchaouen region:

- On March 20th, 2019, in Tetouan with resource persons at the Regional Delegation of Water and Forests of Tetouan (AEF)[9]
- The same March 20th, 2019, in Tetouan, with the Division of Spatial Planning and the Regional Council of Tangier-Tetouan-Al Hoceima

[8] Reinert, Max. Une méthode de classification des énoncés d'un corpus présentée à l'aide d'une application. Cahiers de l'analyse des données, Volume 15 (1990) no. 1, pp. 21-36. http://www.numdam.org/item/CAD_1990__15_1_21_0/

[9] The administration is the managing actor of the RBIM

- On the 21st, with the Mixed Syndicate and Group of Communities (rural municipalities of Bouhachem Park), leaders of rural tourism and agro-ecology projects and family farm managers in Douar Al Houmar and Bellouta.

Figure 7. AMU – UM5 team in Chefchaouen region

3. Outcomes

The analysis allowed coding outcomes in a series of concerns and messages by respondents, which are related with the Edu-BioMed scope and that are presented in the present section, and resumed in Table 5.

TOPIC	JMBR	SBR	RBA	RBIM
PEDAGOGY/TRAINING/AWARENESS RAISING	**	***	**********	***
COMMUNICATION	*	*		*
BR KNOWLEDGE	*		**********	*
BR MANAGEMENT		**	*****	**
ECOTOURISM	***	*		
WASTE TREATMENT	**			
BUILT ENVIRONMENT	*	*		
THE YOUTH	*			*
FOREST FIRES	**	**		
FOREST MANAGEMENT	*		*****	
ENVIRONMENTAL PROTECTION	**	**		*
EMPLOYMENT	**			*
FINANCE	*			
MARKETING	*	****	**	
AGRICULTURE/FARMING	******	**	*****	**
POLICY/LAW	*****	***		
GOVERNANCE	**	**	******	****
HUNTING		*		
EQUITY AND JUSTICE		*		**

Table 5. Resume of outcomes. For each BR (JMBR, SBR, RBA, RBIM), it is identified whether or not respondents expressed themselves about a particular topic. The number of asterisk corresponds to the number of concerns about the particular topic that have been raised.

3.1. *Jabal Moussa* BR, Lebanon

- **PEDAGOGY/TRAINING.**
  - Need for a pedagogical training centre that welcomes young people or trainees to learn about the principles of agriculture, soil quality, biodiversity or environmental protection, endemic species in Lebanon.
  - Develop an intensive training programme for BR managers to acquire entrepreneurial skills: planning, teamwork, marketing, communication and financial management.

- **COMMUNICATION.** Need for a communication system between JMBR staff and people in the seven surrounding villages of Jabal Moussa Mountain to inform about how they can engage in the territorial management.

- **BR KNOWLEDGE.** Lack of awareness of local communities to the guidelines established by the JMBR.

- **ECOTOURISM.**
  - Need for sensitize the inhabitants of the villages of the JMBR to ecotourism by relying on the natural and historical resources of Jabal Moussa, with the dual aim of guaranteeing the integrity of these areas and providing local populations with an income from this use.
  - Need for a network of easily accessible guest houses.
  - Organize days of "guided" thyme picking by village women who will share their knowledge and skills with tourists

- **WASTE TREATMENT.**
  - Need for a feasibility assessment for the creation of a composting system for organic waste.
  - Need for the support of the municipalities JMBR that are ready to implement an action plan to solve the problem of waste.

- **BUILT ENVIRONMENT**. Village roads that provide access to the JMBR need to be secured, and infrastructures strengthened

- **THE YOUTH.** Provide young people in the local communities of Jabal Moussa with a list of local authorities/NGOs/academics to support them in their professional project.

- **FOREST FIRES.**
  - Need for an action plan to fight fires in the forests of Jabal Moussa.
  - Raise awareness of fire risks in local communities by providing fire awareness programmes in schools in the region, including fire-fighting awareness in Jabal Moussa.

- **FOREST MANAGEMENT.** Logging of cut trees without taking into account environmental impacts

- **ENVIRONMENTAL PROTECTION.**
  - Show local communities, through illustrated signs, the fauna and flora found on their lands and villages included in the JMBR. => Teach them to respect the marking of paths so as not to trample on the flora, some species of which are on the verge of extinction.
  - Various environmental stressors: (i) deforestation; (ii) Overgrazing; (iii) Pollution of watercourses; (iv) Logging of wood (v) No recycling or waste treatment

- **EMPLOYMENT.**
  - Create employment, promote adequate labor demand, ensure a supply of skilled labour, match supply and demand and pursue employment-friendly economic policies.
  - it emerged the idea of a regional mapping of jobs/businesses in the villages surrounding the JMBR was raised. It is one of the tools used in human resources planning or strategic workforce planning. This practice would stimulate the support of institutions / local communities / key stakeholders in each region. The objective is to know the professions practiced in the surrounding villages of the JMBR and their evolution, in order to anticipate training needs and to propose an adequate labor offer. It is then much easier to fund feasibility studies for such projects, as well as training programs on emerging research within the RBJM.

- **FINANCE.** Lay the foundations for sustainable private sector investment (banks, businesses) (CSM) and promote access to finance in rural areas.

- **MARKETING.** digital platforms to engage in e-commerce could be a useful tool

- **AGRICULTURE/FARMING.**
  - promote the creation of new agricultural and agri-food businesses in villages => in accordance with the Berlin Charter (Creating opportunities with the younger generation in the rural world - Final version of 27 April 2017)
  - Provide training and advice to the faculties of agronomy and economics in the partner university institutions in the Edu-BioMed project to future "agri-preneurs" to ensure the sustainability of their agribusinesses and produce profitable and job-creating goods and services.
  - To valorize the fruits produced in these villages through solar drying and marketing.
  - Need for training in solar drying techniques for fruit farmers.
  - Create research centres at JMBR to promote innovation in agriculture, disseminate locally adapted methods (irrigation systems, mechanization, training in improved agricultural practices, use of biopesticides...)
  - Lack of synergies between beekeepers, farmers or other local economic actors in the seven villages around the JMBR

- **POLICY/LAW.**

- Poor knowledge of the legal frameworks governing JMBR, mainly due to (i) non-popularization of policies, (ii) difficulty of access to information, (iii) no professional training at community level
- Tension over property rights between owners of land integrated into the RB and JMBR managers
- Almost no enforcement of existing laws
- Lack of enforcement legislation
- Lack of law enforcement monitoring

- **GOVERNANCE.**
  - Lack of involvement of local communities in decision-making
  - Lack of collaboration between public authorities and civil society

3.2. *Shouf* BR, Lebanon

- **PEDAGOGY/AWARENESS RAISING.**
  - Involvement of universities in environmental awareness raising programs and educational activities
  - Organization of awareness campaigns by the Lebanese Agricultural Research Institute (LARI) for farmers
  - Organize awareness campaigns for shepherds and pastoralists

- **POLICY/LAW**.
  - Provision of adequate information for land use restrictions and recommendations
  - Study of law enforcement mechanisms
  - Legal protection through the implementation of environmental policies and plans by the Ministry of Environment

- **BUILT ENVIRONMENT**. Provide necessary maps and advice by architects and engineers on built environment and landscape

- **ECOTOURISM**. Promotion of ecotourism

- **AGRICULTURE/FARMING**.
  - Design agricultural practices that will serve as a model for landowners
  - Involve agricultural cooperatives in project planning and implementation.

- **FOREST FIRES MANAGEMENT**.
  - Reduce fires and fertilize the soil with controlled grazing
  - Designate appropriate grazing areas away from plantations

- **HUNTING**. Designate proper hunting practices

- **MARKETING**.
  - Recommend compliance of service providers with quality certification standards
  - Design of ecolabeling
  - Facilitation of the integration of service providers into offerings, marketing and sales planning.
  - Support and sponsorship activities - advertising and marketing - facilitation of banking transactions

- **BR MANAGEMENT**.
  - Construction of an improved SBR management plan
  - Re-consideration of conservation in the core area of the reserve and in the buffer zone.

ENVIRONMENTAL PROTECTION

- Supply of high quality seedlings and all types of seedlings by Native Nursery/ Association for Forests Development and Conservation (AFDC)
- Organization of workshops to build capacity and develop cultivation of plant species and seedlings

EQUITY AND JUSTICE. Overcoming inequalities towards key actors in terms of guest rooms, rural products sold in the Park House and at entrances.

GOVERNANCE

- Involve stakeholders in the management of SBR
- Poor coordination between volunteers and the reserve team.

COMMUNICATION. Promote communication with landowners, municipalities and FMCs (Forest Management Committee)

3.3. *Arganaraie* BR, Morocco

- **FOREST MANAGEMENT/AGRICULTURE**.
  - Evaluate and study the needs and challenges of the argan tree for the implementation of operational programmes: (i) rehabilitation; (ii) Arganiculture; (iii) Identification/quantification of ecosystem services; (iv) Processes / technology; (v) Innovation-institution-organization
  - To approach between the theories and the reality of the territory of the argan tree

- Mobilize different disciplines (Geography, Economics, Sciences, Biology,...) for the preservation of the Arganeraie and the development of its territory by identifying its issues and challenges
- Involve the research laboratories for the development of the Arganeraie; this requires funds and resources to ensure the proper conduct of research.
- Valuation of research on the argan tree.

- **PEDAGOGY/TRAINING/AWARENESS RAISING**.
  - Inform and raise awareness of the importance of RBA in school and university curricula, for example developing modules specific to the theme (masters and doctorates).
  - Provide training in the trades required by the reserve's sectors of activity
  - Organize field trips to benefit students to raise their awareness
  - Target the necessary training to support the development of activities
  - Integrate RBA into education programmes at different levels
  - Set up the master with Biosphere Reserve identity
  - Create professional training courses with mandatory internships with organizations and actors.
  - Organize scientific events
  - Organization of conferences and study days on the theme of Biosphere Reserves.
  - Communicate the work of academics to officials and local communities for consideration and practical implementation.

- **RB MANAGEMENT**.
  - Contribute to the production of solutions and innovation for the promotion of the three functions of RBA.
  - To orient research projects towards the sustainable development of the Arganeraie reserve.
  - Identify conflicts of use by the population and their causes.
  - Seek partnerships to implement the application of results in the field through the implementation of projects.
  - Mediatization for the enhancement and awareness of this natural heritage;

BR KNOWLEDGE

- Develop long-term programs to build bridges between the university and field actors and ensure convergence of research on the reserve.
- Define the research addressed to the population and the target audience.
- Encourage collaboration and synergy between research centres interested in RBA.
- Valuing scientific productions made /published through journals specific to the university's environmental themes

- Create laboratories
- Ensure a follow-up of the territory dynamics of RBA.
- Enhancement of the argan tree's spaces in its general context (scientific, agricultural, cultural, economic) and not its isolation from a single field of study;
- Collaboration in groups of actors of different specialties around the argan tree.
- inclusion of local wisdom in knowledge making
- Identify all components of RBA (physical and human).

- **GOVERNANCE**.
  - Integrate researchers into the federation of actors at different levels (regional and territorial). Academics should act as intermediaries between institutions and civil society organizations: faculties and departments, in addition to research centres, can support civil society's claims through their scientific methods by mapping the needs of local communities within biosphere reserves.
  - Establish sustainable mechanisms to ensure links between political actors, research and the local population.
  - Establish a repository of resource persons to be consulted by RBA associations for research.
  - Creation of partnerships between local authorities and civil society associations.
  - Implementation of agreements
  - creation of an IT tool for a kind of electronic governance

- **MARKETING**.
  - Overcome rivalry and competition between external services, local authorities and many associations and cooperatives to promote RBA products.
  - Design of an eco-labeling at the level of RBA

3.4. RBIM, Morocco-Spain

- **BR MANAGEMENT**.
  - Aim to reconstruct the trajectory of the RBIM in the process of setting up universal sustainable development mechanisms.
  - boost partnerships with universities and associations that contribute to the promotion of knowledge. University research structures can use the results of scientific research to advise managers and local communities on risks and threats in the RBIM

- **PEDAGOGY/TRAINING/AWARENESS RAISING**.
  - Develop the educational dimension around socio-ecological issues
  - use ecomuseums and thematic tours as effective approaches to learning and awareness raising

- Integrate women and men in villages through literacy and technical capacity building in agricultural and artisanal production.

- **BR KNOWLEDGE**. Systematize and catalogue indigenous knowledge in order to promote its transmission.

- **COMMUNICATION**. Adapt and resize RBIM communication devices to make them accessible to all by taking into consideration the cognitive differentials of social categories.

- **GOVERNANCE**.
  - Analyze governance and management arrangements
  - Find ways to make governance bodies accessible to non-institutional actors
  - Reflect on other forms of governance that involve local communities that are not or are very poorly informed about territorial issues.
  - To decompartmentalize university research. Beyond the presence of academics on the RBIM Scientific Board, make the results of their research more useful to the community.

- **ENVIRONMENTAL PROTECTION**. Better understand the drivers of environmental degradation, including (i) forest fires, (ii) soil erosion and the clearing of vegetation cover, (iii) agro-pastoral and silvicultural uses and practices; (iv) urban sprawl

- **EMPLOYMENT**. To explore root of unemployment and underemployment in the region

- **EQUITY AND JUSTICE**.
  - To explore spatial inequalities between urban and rural, coastal and inland, and disparities between provinces and municipalities.
  - To orientate training at the different levels of primary, secondary and higher education towards education aimed at the space and environment of the RBIM as part of a regional entity made up of territories unequally integrated into the metropolitan areas of Tangier and Tetouan

- **THE YOUTH**. Support the work of young graduates involved in local associations in terms of the training they provide. Ensure that they have appropriate premises and are supported in the design of training, particularly in environmental and local development matters.

- **AGRICULTURE AND FARMING**
  - Promote ongoing synergies between farmers, cottagers and urban restaurateurs for the use of local products, brought up to agro-ecological quality standards.
  - Explore alternative, more profitable farming methods

4. Concluding remarks

- The outcomes of the focus groups are a starting point for the development of **future case-studies** that are applied to territorial needs.

- The **necessity of a curricula development** at targeted HEIs in the field of BRs is corroborated by the outcomes of the focus groups. Various stakeholders expressed the importance of a strengthen higher education on BRs so to (i) promote the knowledge of the territorial reality (ii) train future professionals with a set of soft and hard skills for the future sustainable management of the territory

- There is the will by stakeholders to make the territory and its facilities at disposal of HEIs for research and education purposes

- There is a need to **explore and systematize local –traditional- knowledge(s)**

- There is a need for **high resolution maps** of the multifaceted socio-environmental reality of BRs: geo-ecology and geo-biodiversity; land use and occupation; built environment; economic activities; policy bodies; governance structures; stakeholders networks

- HEIs can **exploit the results of scientific research to advise** managers, administrators and local communities on risks and threats in the BRs

- **Academics should act as intermediaries** between institutions and civil society organizations: HEIs can corroborate civil society's claims through their scientific methods by mapping the needs of local communities within biosphere reserves.

- The assessment that is presented in this document only ´sratched the surface´ of the territorial reality. The great number of stakeholders makes it difficult to understand all the nuanced complexities of a socio-ecological system like a BR just after a few focus groups. The study paves the way for a future more in-depth assessment of BR needs and demands, and **it is required the instauration of mechanisms of monitoring of BR reality over time. HEIs can perform as observatory of need and demands of local stakeholders**.