EURO MAB ANTALYA 2007
BRIDGING SCIENCE AND SOCIETY

Photo: Olimpos-Beydağları National Park

EuroMAB 2007 Turkey

"Bridging Science and Society"

PROCEEDINGS

United Nations Educational,
Scientific and Cultural Organization

TURKISH NATIONAL COMMISSION UNESCO 1949

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12-16 November 2007, Antalya

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CONTENTS

Acronyms

BR	Biosphere Reserve
BRIM	Biosphere Reserve Integrated Monitoring
DESD	Decade of Education for Sustainable Development
EU	European Union
GEF	Global Environment Facility
GLOCHAMORE	Global Change in Mountain Regions
IUCN	the International Union for Conservation of Nature
MAB	Man and the Biosphere
MAB ICC	MAB International Coordinating Council
MEA	Millenium Ecosystem Assessment
SD	Sustainable Development
UNEP	United Nations Environment Programme
UNESCO Organization	United Nations Educational, Scientific and Cultural
UNITWIN	UNESCO University Twinning and Networking
WHS	World Heritage Site
WNBR	World Network of Biosphere Reserves

Preface

Bridging science and society. This is the motto of the EuroMAB 2007 Meeting. In this meeting participants discussed and evaluated how to promote the interactions between science and society in the context of nature conservation and also how to benefit more from science and technology in ensuring sustainable development. Sharing knowledge and experience at all possible layers of the Society were recognized as the main tool for enhancing the understanding of the MAB concept, thus contributing to its further implementation. Therefore, the regional network of UNESCO, EuroMAB, should be considered as an "**available platform**" for academicians, technocrats, decision makers, NGOs and local people living in and adjacent to the Biosphere reserves for sharing knowledge and experience and formulating priorities and common activities for the years to come.

The EuroMAB 2007 Meeting was organized by the Turkish National Commission for UNESCO jointly with UNESCO MAB Secretariat, UNESCO Venice Office, UNESCO Moscow Office, Turkish Ministry of Environment and Forestry, from 12 to 16 of November 2007, in Antalya, Turkey. The efforts made by Turkish MAB National Committee in the organizing of the EuroMAB 2007 should be also strongly appreciated. The EuroMAB 2007 gathered 123 participants from 32 countries. Ensuring the broadest possible spectrum of participants in terms of their job and position, such as managers or coordinators of Biosphere reserves, academicians, representatives of NGOs, as well as PhD students studying in this field, were highly considered while organizing the Meeting.

The first plenary of the Meeting was opened by a presentation of Austrian representative to remind what had been discussed and formulated in the previous EuroMAB Meeting held in Austria in 2005. Further on, the keynote speeches of five eminent colleagues guided the discussions, carried out within the working Groups formed in order to discuss and evaluate each of the chosen themes of the meeting. At the closing session, namely in the second plenary, all participants gathered to share the outputs of the working groups.

The first outputs of the EuroMAB 2007 are two important documents. **Contributions of Europe and North America Region to the Madrid Action Plan** and **EuroMAB Action Plan for 2008-2009**. Turkish MAB National Committee prepared and published a booklet, consisting of information on the EuroMAB Action Plan for 2008-2009 and distributed it during the III World Congress of Biosphere Reserves, held from 4-9 February 2008 in Madrid Spain, just two months after the EuroMAB 2007 Meeting.

Besides, during the EuroMAB 2007 meeting, several side events and cultural activities such as “Cultural Night” were organized in order to let the participants experience the cultural diversity of Europe and North America Region. One day excursion to the Olympos-Beydaglari National Park was organized also to demonstrate the interactions between tourism developments and nature conservation.

Another output in hand is the proceedings of the EuroMAB 2007. This publication encompasses presentations of the keynote speakers, other participants, as well as the reports of the thematic groups. The EuroMAB Action Plan is placed just at the beginning of the publication in order to make the document more user-friendly. Regretfully, the proceedings do not consist of all the presentations, since it turned to be difficult to gather them afterwards. In order to compensate this deficiency, the readers can obtain information about them from the attached CD. The group reports had not been modified afterwards in order to keep their original way of delivery.

Last but not least it should be emphasized that the real contributors to this proceedings are all the participants, including speakers, moderators, reporters and volunteers. On the other hand, the Turkish National Commission for UNESCO, its MAB National Committee, UNESCO’s MAB Secretariat, UNESCO Venice Office and Turkish Ministry of Environment and Forestry should be strongly commend for their financial and technical contributions.

Hopefully, this proceeding will prove to be useful for the whole of the MAB Family.

Dr. Nihat ZAL
Secretary general

Turkish National Commission for UNESCO

Executive summary of the results

Executive summary of the results

Turkish MAB National Committee and Turkish National Commission for UNESCO with support from UNESCO BRESCE Office, UNESCO Moscow Office and the MAB Secretariat, Turkish Ministry of Environment and Forestry, and General Directorate of Nature Conservation and National Parks jointly organized the EuroMAB 2007 Meeting for MAB National Committees, biosphere reserve coordinators, experts and young scientists of the EuroMAB Region.

123 people from 32 different countries of EuroMAB network came together in "Bridging Science and Society-EuroMAB 2007-Turkey" at city of Antalya. The meeting focused on how to enhance linkages between Science and Society, using the experience of the 254 biosphere reserves in the 32 countries making up the EuroMAB Network as learning and sharing sites for sustainable development.

Throughout the meeting EuroMAB members shared their experiences and ideas on the five thematic issues through presentations, group works and discussions:

1. How to use biosphere reserve as learning sites for sustainable development and what
   contributions to the UN Decade of Education for Sustainable Development?
2. How to enhance the capacity of biosphere reserve to mitigate/abate and adapt to climate change?
3. How does zonation of a biosphere reserve contribute to sustainable development?
4. How to better reach and capture the economic and social benefits of biosphere reserves?
5. How can biosphere reserves deal with environmental transformations such as urbanization and in-/out migration?

Outcomes

EuroMAB 2007 meeting defined an agenda for the EuroMAB Network in order to better integrate the science and knowledge sharing approach within biosphere reserves with practices and management of natural and cultural assets in EuroMAB region, in order to make this Network and its achievements more visible an politically relevant in the region.
The main outcomes of the meeting are:

1. Communication strategy for building effective EuroMAB network identity, network governance and outreach
2. EuroMAB network global contribution

3. Proposals for partnerships and cooperative actions on EuroMAB actions and activities in science, development, education, capacity building, learning and policy issues
4. Sources of funding for the proposed actions
5. EuroMAB network contribution to Madrid 2008 Congress

1. Communication strategy for building effective EuroMAB network identity, network governance and outreach

1.1. EuroMAB Governance:

- Network facilitation through volunteering countries with support from the MAB Secretariat and UNESCO field offices
- Effective use of EuroMAB web platform
- Establishing effective thematic working groups on:
  - Education for sustainable development (tools-methods-resources)
  - Participation in Biosphere Reserves (tools-models-assessments)
  - NGO involvement
  - Biosphere Reserve Governance
  - Building political support
  - Citizen science
  - Resilience in Biosphere Reserves
  - Eco-tourism

Volunteering countries that would to take the lead for the different groups will be discussed in Madrid.

1.2. EuroMAB Outreach and Communication

- Use the EuroMAB platform to promote the EuroMAB network especially for:
  - Exchange of experiences, building up a clearing house for existing programmes and incentives which are useful for the Biosphere Reserves in the network communication and negotiation techniques, for better interpretation of the Biosphere reserve zonation and communicating potential benefits to the local stakeholders;
  - Dissemination of best practices to inform national citizens, and in particular populations living within biosphere reserves;
  - Publish research results in a "digested" version on the EuroMAB website (MAB National Committees and Moscow Office for support for translation);
  - Publish cooperative research proposals to be published on the EuroMAB website in order to find research partners;
- Urban Biosphere reserves should capitalize on their proximity to universities to better link with a diverse range of research areas.
- Publish a new online magazine
- Involve youth in biosphere activities

2. EuroMAB Network Global Contribution

- Assessment of different biosphere reserve zones to ecosystem services, to be taken into consideration within the periodic review process
- Development of a specific methodology to harmonise zonation in transboundary biosphere reserves;
- A leadership role in driving forward the Urban Biosphere agenda
- Developing a study on existing legislations on biosphere reserves, targeted at decision makers, and providing sound guidance to Governments.

3. EuroMAB Action Plan

(Proposals for partnerships and cooperative actions on EuroMAB actions and activities in science, development, education, capacity building, learning and policy issues)

Science	Promoting EuroMAB to be included in existing monitoring networks emphasizing the socioeconomic and ecological monitoring recognizing MAB tools (BRIM, GLOCHAMORE)	MAB Secretariat and MAB National Committees
	Launching an e-working group on citizens and science	France MAB Committee
	Linking with other UNESCO Intergovernmental science programmes to develop climate change related science projects on Biosphere Reserves at a national and regional level.	MAB Secretariat
	Initiating scoping studies on how biosphere reserves can provide social benefits	MAB Secretariat and UNESCO BRESCE Office
Development	Feasibility studies for sustainable economic practices for selected enterprises in order to facilitate sustainable business development	MAB National Committees
	Disseminating and further applying the approaches and lessons learnt from the UNEP/GEF Project "Conservation and Sustainable Use of Biodiversity through Sound Tourism Development in Biosphere Reserves in Central and Eastern Europe" in the region, with particular emphasis on SEE	MAB National Committees and interested biosphere reserves, MAB Secretariat, UNESCO BRESCE Office
	Compiling existing activities/ mechanisms for payment for ecosystem services, ecosystem and MA approaches	MAB National Committees

Education	Publishing guidelines for Biosphere Reserve Coordinators on how to "deal with climate change at a reserve level?"	MAB Secretariat
	Promoting twinning of biosphere reserves schools in the framework of DESD through EuroMAB web platform	France MAB Committee
	Developing, testing and disseminating teaching and learning tools (textbook initially developed by MIO-ECSDE / Greek MAB NC) referred to MAB BRs as "learning places" for DESD	MAB National Committees and interested Biosphere reserves, MAB Secretariat, UNESCO BRESCE Office
Capacity building	Organizing a workshop on how to attract finance for climate mitigation projects through Kyoto Protocol and others	MAB Secretariat
	Organizing a training course on MA framework on ecosystem services	MAB Secretariat
	Studies on existing legislation on biosphere reserves	France MAB Committee
	Organizing training courses on the methodology to establish or revise the zonation in biosphere reserves, based on the ARDI *(Actors, Resources, Dynamics and Interaction)* methodology	France MAB Committee
Learning	Catalogue of adaptation and mitigation practices in EuroMAB and beyond	MAB Secretariat and Germany MAB National Committee
	Research and education opportunities leaflets for Universities	Austria MAB National Committee
	Synthesis of information on zonation patterns in biosphere reserves, including lessons learned and difficulties	MAB Secretariat
	Publishing on the EuroMAB website the availability of the universal biosphere reserve label procedure, the procedure of applying the label and the pilot sites which are already using the label	MAB Secretariat
	Organizing a special forum for sites to share their urban biosphere experience at the next EuroMAB meeting	MAB Secretariat

Policy	Setting up adaptation and mitigation policies strategies and actions in a range of reserves to demonstrate science and policy interaction incorporating local and 1ultural knowledge as well as scientific information	MAB Secretariat and MAB National Committees
	Delivering actions with all sectors including the private sector exploring the costs and opportunities of climate change	MAB National Committees
	Networking of Cities – coordinating a network of urban areas with an interest in the use of the Biosphere Concept	MAB Secretariat
	Promoting on EU level the important function of agro-environmental schemes for the Biosphere reserves and offer biosphere reserves to be used as testing sites	MAB National Committees

4. Sources of Funding

Action	**Responsible Organization**
Investigation of Framework 7 Call for proposal	Belarus MAB National Committee
Investigation of Interreg 4 Programme	UK MAB National Committee
Carbon Finance for application of measures	MAB Secretariat and MAB National Committees
Cooperation with private sector	MAB Secretariat and MAB National Committees
Participation Programme of UNESCO	UNESCO Member States

Opening Remarks

Opening remark

Dr. Mahir KUCUK
Cahirperson of Turkish MAB National Committee

Distinguished MAB coordinators, managers, representatives, scientists and other participants, dear press members

I would like to welcome all of you on behalf of my Country and The Ministry of Environment and Forestry. It is a great pleasure to host you in such a wonderful city of Turkey.

Taking this occasion as an opportunity I would like to give you some short information about Turkey and our activities, carried out by the Ministry of Environment and Forestry.

As it is known, Turkey is situated in the Northern Hemisphere near the junction of the continents of Europe, Asia and Africa. The total surface area of Turkey is more than 800.000 square kilometer. Turkey lies in various climate regions from the Mediterranean to continental climate in Eastern Anatolia. Due to these very special geographical conditions the country is significant for ecosystems diversity such as forest, steppe, wetlands and marine ecosystems and also for biodiversity both in terms of flora and fauna and level of endemism, among Europe, North Africa and Middle East. Additionally more than 27 percent territory of Turkey is covered by natural and semi natural forest.

Turkey is a signatory country of Biodiversity, Combat Desertification and Climate Change Conventions. Since 1956 nature conservation activities including determination, planning, management and monitoring of protected areas has been systematically implemented by the Ministry of Environment and Forestry. During this period of time 10 percent of total territory of Turkey is under protection with a number of 910 protected areas in very different protected areas categories.

Our main objectives are to provide our people with a better environment and also to ensure the future of sustainability of forest and biodiversity which the country possesses.

The main challenge of the forestry and natural resource management of the Twentyfirst Century is to stop the pressures caused by over using natural resources affecting on deforestation and threaten the biodiversity, and to meet expectations of all different sectors in balance. While doing this, we are obliged to deliver these services by taken into account sustainable development as a main approach.

As it is known, providing sustainable development is not an easy task. It needs the ways of more creative, innovative and flexible mechanisms involved all related stakeholders of community. People expect to have more benefits from natural resources, job guarantees and rights in decision making. Therefore, the main responsibility of decision makers is to create democratic atmosphere in order convenient platforms to be established for involving all stakeholders.

Besides the challenges that our contemporary world are facing with- such as climate change, tsunami, natural hazards, water issues and food security, we need to have not only knowledge society but also conscious society. Conscious society is expected to be well aware of how to benefit from natural resources in a sustainable way rather than how to consume these resources excessively.

We have to determine new strategies and approaches to make guarantee the Sustainable World. UNESCO's Man and the Biosphere Programme since its very flexible and innovative approaches to management of natural resources providing conservation of biodiversity, its logistic supports such as education for sustainable development, scientific researches, sharing knowledge and experience and also networking among people and areas gives us a chance to cope with the multidimensions of new challenges of the World.

I am convinced; that the thematic issues selected to be discussed and evaluated in this meeting will be resulted with many concrete recommendations not only for our region but also for the Madrid Conference, which will take place in February 2008, in Spain. Besides, determining an action plan for Europe in the context of MAB Programme may be more beneficial roadmap in order to formulate our common activities in the region for the years to come.

Although recently joined to UNESCO's Man and the Biosphere Program in 2005, Turkey emphasizes the importance of the implementations in its first Biosphere Reserve, Camili, in accordance with main objectives of MAB Program. In this regard, Turkey also supports bilateral and multilateral collaborations in the Region. I am pleased to acknowledge here that we have already started several initiatives with Bulgaria, Greece, Azerbaijan, Georgia and many other countries in the Region to carry out joint activities in nature conservation and other fields of competence.

Finally, I wish you have a productive, successful and fruitful meeting. And I would like to give my regards to all participants and distinguished guests.

Enjoy your stay in Antalya. Thank you all.

Introductory presentation

EuroMAB in the Future of the UNESCO Programme on Man and the Biosphere (MAB) and the World Network of Biosphere Reserves (WNBR)

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Division of Ecological and Earth Sciences
and
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UNESCO

Abstract
As the region of the world with the longest histories of industrialization, science and technology development and nature and wildlife conservation, EuroMAB countries have a unique opportunity to experiment with biosphere reserves as learning places for sustainable development. Knowledge and best practice cases generated via such experimentation must be widely shared with other parts of the world for the benefit of MAB and biosphere reserve communities.

Key words: *Man and the Biosphere; biosphere reserve*

1. Introduction

This EuroMAB meeting, generously hosted by the UNESCO National Commission and the MAB National Committee of Turkey in Antalya during 12-16 November 2007, is convened when most of us have "Madrid in our minds"! In less than three months from now, i.e. between 4 and 8 February 2008 many of us will meet in Madrid, Spain, at the 3rd World Congress of Biosphere Reserves and the 20th session of the International Co-ordinating Committee (ICC) of the MAB Programme. Europe, as the region of the world where industrial civilization originated and had early impacts on nature has a special contribution to make towards the global mission of MAB. The mix of EuroMAB countries gathered here, from Western, Eastern, Central and Northern Europe as well as US, Canada and Russia, collectively represent the near totality of the industrialized world where current philosophical and scientific questions concerning the relationship between humans and biosphere had their origins. Several representatives of EuroMAB Member States contributed towards the design and development of the MAB Programme and its World Network of Biosphere Reserves. 36 years after the launch of the MAB Programme by UNESCO in 1971, and 31 years after the

first inclusion of sites in the World Network of Biosphere Reserves (WNBR) in 1976 both MAB and the WNBR are at critical moments of their interlinked histories. EuroMAB has a special opportunity to influence the future of both MAB and the WNBR.

2. The Man and the Biosphere (MAB) Programme

John McCormick (1995) singles out the dedication of its first Director General, Mr. Julian Huxley for UNESCO's leading role in working with concepts and programmes linked to the relationships between humans and nature. Thanks to the efforts of Mr. Huxley, the UNESCO General Conference that met in 1947 viewed the enjoyment of nature as part of culture and the "preservation of rare and interesting animals and plants" as a scientific duty. It was Mr. Huxley's commitment that convinced UNESCO to convene the first ever technical conference on nature protection and international co-operation in ecological research: the UN Scientific Conference on the Conservation and Utilization of Resources (UNSCCUR) held in Lake Success, New York, USA in 1949.

Many features of the current global environmental governance infrastructure had their origins in the late 1960s and the 1970s. In UNESCO, The Biosphere Conference (1969) picked up the theme of international co-operation in ecological research that had been first explored in UNSCCUR in 1949, and led to the launch, in 1971, of the Man and the Biosphere (MAB) Programme.

MAB of the 1970s and the 1980s was anchored on 14 projects: projects 1-7 focussed on studies on the major ecosystems of the world and the impacts that humans were having on them. Projects 9-14 addressed principal processes driving economic development and their environmental impacts; for example, MAB Project 11 dealt with ecological effects of urban systems with particular emphasis on energy utilization. Sandwiched between projects 1-7 and 9-14, MAB Project 8, addressing the conservation of natural areas and the genetic resources they contain therein, led to the establishment of today's World Network of Biosphere Reserves (WNBR).

Over more than 30 years MAB has undergone changes to give it greater focus on issues and problems of continuing relevance to international relations in environment, conservation and development. Following several evaluations during the 1980s and the 1990s today's MAB has its ecosystem studies focussing primarily on mountains, dry and arid lands, forests, coastal zone and small islands and urban areas. WNBR has become, particularly since the adoption of the Seville Strategy and the Statutory Framework for the World Network adopted by UNESCO in 1995, the preferred places for design, development and implementation of most MAB projects and activities.

3. The World Network of Biosphere Reserves (WNBR)

In line with the title of the original MAB project 8 - conservation of natural areas and the genetic resources they contain therein - the first biosphere reserves were predominantly national parks and similar reserves whose principal aim of management was the conservation of nature, species and ecosystems. Some early biosphere reserves of the late 1970s, particularly in the US, were ecological experimental and research stations.

The Action Plan for Biosphere Reserves (1984) that was the outcome of the first World Congress of Biosphere Reserves held in Minsk, Belarus (previously Byelorussia) in 1983 and marked the first steps in the extension of the functions of biosphere reserves beyond conservation to include development and the logistic ones. The latter function refers to a mix of research and monitoring, education, training and capacity building and local community and stakeholder participation approaches and is increasingly seen as the function dedicated to learning and generation knowledge for sustainable development. The recognition of the triple functions of biosphere reserves emerged in parallel with the three zones, namely core, buffer and the transition zones, respectively, as the defining feature of all biosphere reserves. Particularly after the adoption by UNESCO in 1995 of the Seville Strategy and the Statutory Framework for the WNBR, elaborated at the second World Congress of Biosphere Reserves in Seville, Spain in 1995, this trend has been mainstreamed. Today a biosphere reserve nomination that does not have these three zones, include resident human populations in one or more of the three zones and lacks a clear description of the three functions is unlikely to be included in WNBR.

Given the evolution of the biosphere reserve concept and its practice as outlined above today's WNBR has a mix of sites ranging from classical national parks, e.g. Yellowstone (USA) and Galapagos (Ecuador) through ecosystems that are intensely modified (Fontainbleau, France) or damaged and recovered by human action (Can Gio, Vietnam) to extensive landscapes that include legally protected parks as core and a vast variety of land/seascapes ranging from natural to the urban in buffer and transition zones. A good example of the latter type of biosphere reserve is the 29 million hectare Mata Atlantica Biosphere Reserve of Brazil. Its core is around 4 million hectare and the buffer and transition areas are each nearly 12 million hectares; the biosphere reserve includes about 5,000 municipalities and about 100 million people live in 3,307 of those municipalities (see www.unesco.org/mab/ for more details and additional examples).

The first (1983) and second (1995) World Biosphere Reserve Congresses marked distinct turning points in the evolution of the concept and practice of biosphere reserves; for example, if one considers the three zones that now characterize a biosphere reserve, only 23% of the 236 places included in WNBR up to 1984

identified the three zones. The percentage of sites with the three zones rises to 65% of the 84 included in the WNBR from 1985 to 1995. In contrast, 98% of all sites included in WNBR from 1996 until present have all three zones identified. EuroMAB countries account for 255 sites (in 48 countries) of the total number of 531 sites (in 105 countries) that now constitute the WNBR. Of this 255 EuroMAB biosphere reserves, 172 were included in WNBR before 1996 and in countries like the US nearly all of its 47 sites were from the pre-1996 period. The Madrid Action Plan expected to be adopted at the third World Congress of Biosphere Reserves during 4-8 February 2008 in Madrid, Spain, will identify steps through which all pre-Seville (i.e. pre-1995) biosphere reserves come to meet post-Seville standards with regard to their triple functions, three zones and the presence of resident human populations in buffer and/or transition zones of the biosphere reserves.

4. EuroMAB, MAB and WNBR Futures

Two principal drivers will influence convergence amongst EuroMAB and global MAB and WNBR futures. One is the commitment of all biosphere reserves to contribute towards regional sustainable development priorities. The conservation, development and the logistic (knowledge) functions of biosphere reserves enable the identification of the mix of environmental, economic and social characteristics that will define sustainable development options that each biosphere reserve may pursue. The second commitment is towards a learning approach. The fundamental characteristic of a learning approach is a commitment towards monitoring change against baselines that have been agreed upon based on available scientific knowledge and through stakeholder consultation processes.

Pursuing a learning approach towards sustainable development practice in biosphere reserves requires that context specific environmental, economic and social parameters and the level of integration amongst them will be monitored in a growing number of projects in all three zones. In the design, development and execution of such projects description of baselines for parameters to be monitored will become and integral feature of stakeholder negotiations and management practice.

In 2005, the Bureau of the MAB/ICC called for efforts to refine the Periodic Review Process of the Statutory Framework for WNBR with a view to encouraging the practices of baseline establishment and change monitoring in biosphere reserve management. A pilot project targeting a small number of biosphere reserves where methodologies and protocols for baseline establishment and change tracking of environmental, social and economic parameters as well as the nature and degree of stakeholder participation in monitoring change is being currently developed by the MAB Secretariat in co-operation with several partners.

Biosphere reserves in EuroMAB countries by participating in such pilot projects can contribute substantially towards knowledge sharing with other parts of the world and participating in international collaboration to increase biosphere reserve contributions to regional sustainable development. The EuroMAB set of 255 biosphere reserves have places that belong to first (pre-1984), second (1984-1995) and third (post-1995) generation of biosphere reserves, respectively. In adapting the first and second generation sites to fully meet the norms of the Seville Strategy and the Statutory Framework for WNBR, and enabling third generation sites to actively engage in experimenting with applications of sustainable development principles in context specific situations, EuroMAB can generate models and lessons that can be widely shared with other parts of the world. In fact, EuroMAB countries are also some of the most advanced in terms of science and technology committed to sustainable development. The learning approach to sustainable development practice can generate, during the period of the next medium term strategy (2008-2013) of UNESCO lessons, case studies and other pedagogic tools that can benefit the UN Decade of Education for Sustainable Development (UNDESD; 2005-2014) currently underway with UNESCO providing leadership for the overall UN system.

5. Conclusion

In its 21st century vision and action plan, the Ecological Society of America (ESA) calls upon ecologists to forge partnerships in scales and in forms that they have not traditionally been used to. ESA call upon alliances of ecologists to: enhance the extent to which policy and decisions are ecologically informed; advance innovative ecological research directed at sustainability of an over-crowded planet; and stimulate cultural changes within the science itself that build a forward-looking international ecology (ESA, 2004)**.** As the world's first intergovernmental and UN programme whose disciplinary basis lay in the ecological sciences, MAB can take up the challenge posed by ESA and give it expression in the management of biosphere reserve for attaining regional sustainable development goals and objectives that are linked to global targets such as the Millenium Development Goals (MDGs). EuroMAB countries with their unique history of industrialization, science and technology development and nature and wildlife conservation approaches are uniquely positioned to provide global leadership in experimenting with biosphere reserves as learning laboratories and places for sustainable development. The six year period (2008-2013) beginning from the 3rd World Congress of Biosphere Reserves and the 20th session of the MAB-ICC in February 2008 is a critical period for demonstrating the value of biosphere reserves for experimenting with the applications of sustainable development principles and for illustrating a range of best-practice cases. The documentation and dissemination of biosphere reserves' tested case studies on sustainable development could be UNESCO's most important contribution for the UN Decade of Education for Sustainable Development (2005-2014).

6. References

Ecological Society of America (2004). 21st Century vision and action plan for the Ecological Society of America. ESA, Washington, D.C. 55 pages.

McCormick, John (1995). The global environmental movement. John Wiley & Sons. 312 pages.

Keynote Presentations

How to enhance the capacity of biosphere reserves to mitigate/abate and adapt to climate change?

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Abstract
If we want to seriously address climate change, we have to go beyond two legislative cycles and more: Mitigating climate change consequences whilst considering the costs of adaptation necessitates a long-term perspective. Such a long view requires, however, a broad mind: The key trends facing Europe can change significantly. We need tools that allow us to think in different perspective, think outside in and engage different forms of knowledge.

The development of alternative long-term scenarios can help in this regard. This article illustrates this claim by presenting the PRELUDE project of the European Environment Agency. Scenario development, if done in the right way, can help to create bridges between science and society and can help to foster dialogue and agreement among key stakeholders about long-term objectives for managing the mitigation and adaptation to the impacts of climate change. Biosphere reserves are in a unique position to contribute to this discussion.

Key words: *Scenarios, stakeholder participation, climate change, land use, PRELUDE*

1. Introduction

Climate change is a central challenge for society in the 21st century. If we want to seriously address it, we have to go beyond two legislative cycles and more: Mitigating climate change consequences whilst considering the costs of adaptation necessitates a long-term perspective. Investments into traffic infrastructure, for example, or in power plants have a time span of forty years and more. They determine pathways of development that are difficult to be revised in the future. As a consequence it is necessary to design them in a way that they do not contradict present and future requirements of sustainable development.

Such a long view requires, however, a broad mind: The key trends facing Europe can change significantly, due to surprising events, disruptive technological or economic change or political action itself. Furthermore, we cannot treat climate change in isolation but we have to understand the links to other key socio-

[1] This article does not reflect any official opinion of the European Environment Agency, but the personal opinion of the author only.

economic developments. Take demography, for example: Europe's population is ageing and the consequences for the stability of socio-economic development in some of Europe's regions might be severe. Demographic developments are important also in a different perspective: A large part of Europe's farmers are already older than 55 years. The abandonment of extensive agriculture in less favourable areas might have severe impacts for biodiversity, and the resilience of ecosystems with regard to climate change impacts.

Climate change, demographic change, but also globalisation are just a few factors that will profoundly change the context of policy-making, and the repercussions will be felt in biosphere reserves, too. When we are talking about mitigating and adapting to climate change in biosphere reserves it is thus important to take the full picture into account (CEC 2005). We know a lot about climate change, demographic developments or trends in agriculture. But how often do we put all the facts together and try to make sense of the bigger picture?

More often than not our assessments are rather narrowly focused, being based on simple extrapolations from past trends into the future. While this practice is valid to analyse short-term development, it struggles to deal with the complexity of future development and its potential for disruptive change in the longer-term perspective. If we want to enhance our capacities to deal with climate change, we need broader, more integrated assessments that address discontinuity and map uncertainty. We need tools that allow us to think in different perspective, think outside in and engage different perspectives and forms of knowledge to come to a better understanding of complex long-term problems and related problem-solving strategies.

The development of alternative, exploratory scenarios in a participatory manner is a helpful tool in this context. Throughout the reminder of this article, I will use one of the scenario projects of the European Environment Agency as a case study to illustrate this approach to policy support, share some of the lessons we learnt and discuss related opportunities for the EuroMAB network.

2. Developing participatory scenarios on a European level – the PRELUDE experience

Land use change is a key and pressing challenge to sustainable development. It is thus of strong relevance for the management of biosphere reserves. The European Environment Agency initiated the PRELUDE project (*PR*ospective *E*nvironmental analysis of *L*and *U*se *D*evelopments in *E*urope) to explore plausible long-term developments in land use and their effects on the environment – from 2005 to 2035 for EU 25 plus Norway and Switzerland – in a set of alternative scenarios. This analysis should provide a context against which the potential of (environmental) policy initiatives can be judged.

Since land use cuts across a wide range of policies and thus affects a wide range of societal interests, the EEA invited a group of thirty stakeholders from across Europe to develop five different storylines of how Europe could develop until 2035. This included policy-makers, academic researchers, representatives of interest groups and independent thinkers. Stakeholders met three times for three-day events within a year to build the scenarios. The scenarios were underpinned with spatial explicit data from land-use simulation models. In an iterative process, stakeholders reviewed in how far the model results matched the key aspects of their storylines. The whole process was moderated by external partners (see Volkery et al., 2007).

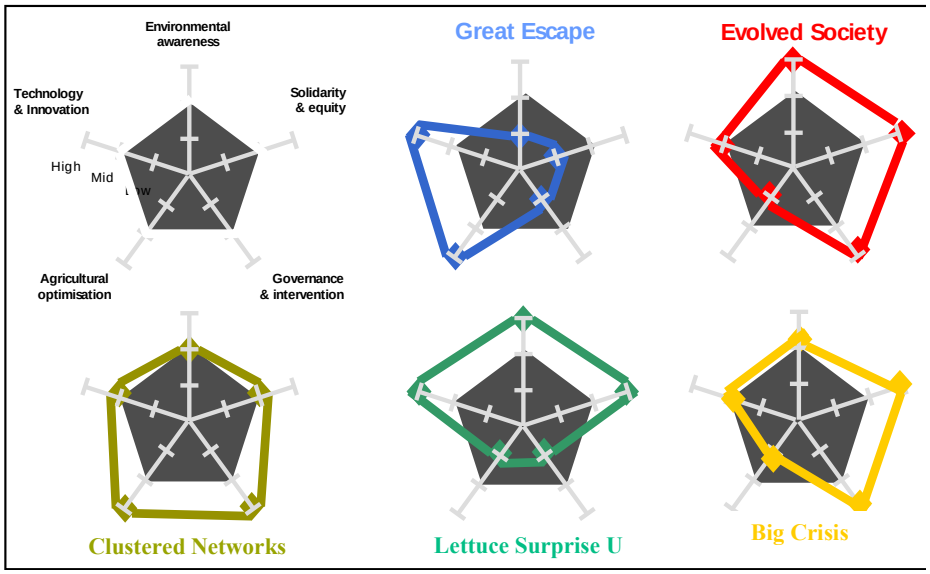

Figure-1. Simplified spider diagrams of key drivers in the PRELUDE Scenarios *(Source: EEA (2007a)*

Stakeholders categorised a broad variety of driving forces that influence different land use types and land use change in Europe. Consequently a common basis for comparison was needed. This was done in a step wise approach (EEA, 2007a):

- "Influence chains" were generated by the group and agreed upon.
- The influence chains and general driving force categories were used to derive a consistent set of 20 driving forces.
- Together with the stakeholders, the magnitude of change of the driving forces was qualitatively valued for each scenario on a scale from 0 (minimum value) to 10 (maximum value).

- This scale was adjusted to for the model inputs into acceptable values for each driving force, based on past data and existing authoritative scenarios for other issues (i.e. IPCC SRES scenarios).
- Finally, the 20 driving forces were clustered into five main categories. Scenario-specific "spider diagrams" were created, visualizing the different driver values in a comprehensive and easily comparable way.

The five archetype scenarios thus reflect a wide array of basic economic, social, technological, political and environmental developments, including emerging trends and disruptive events when considered relevant.

On this basis, we can compare the general environmental implications of land use change in the different scenarios. The analysis clearly illustrates the magnitude of the challenge of preserving traditional rural landscapes and their biodiversity against the background of changing socio-economic and environmental framework conditions. Abandonment of agriculture land, for example, occurs in all scenarios, even in the scenarios that work with strong assumptions on effective policies. Land abandonment directly threatens traditional, rich rural landscapes. While they disappear in all scenarios, the scope and speed differs significantly. Southern and eastern Europe could be particularly affected by the combined effects of intensification of agriculture and rural land abandonment.

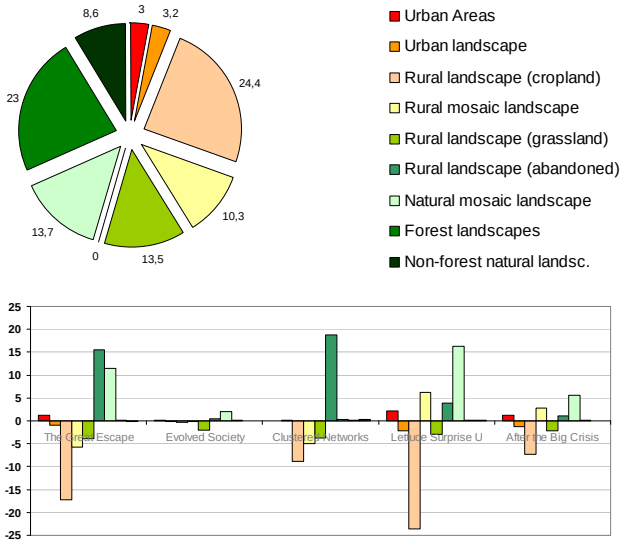

Figure-2. Landscape type changes 2005-2035 in the PRELUDE scenarios
(Source: EEA 2007a, see http://www.eea.europa.eu/prelude for further details)

The PRELUDE scenarios suggest that the conservation of all areas of interest seems unlikely against this background. They underline a need to set stricter spatial priorities for rural development, and find new approaches for monitoring the effectiveness of related programs and measures. In some situations, all efforts might be needed to conserve a valuable landscape. In others, the right decision could be to let change happen, as it cannot be prevented in the long-term. Targeted, coordinated policies are an important differentiating factor in the scenarios. They can help minimise the loss of areas of interest, i.e. in "Evolved Society" and "Big Crisis". Strong spatial planning also leads to concentrated urban development and helps in creating green belts around cities in "Clustered Networks". Autonomous developments like in "Great Escape" are not beneficial in this respect.

3. Policy implications – and some reflections on a potential role of EuroMAB

Setting stricter intervention priorities requires better information. This concerns a better understanding of the distribution of areas of high nature value and biodiversity in order to be able to draw a priority list. Current data provide an insufficient overview. But it also concerns a better understanding of the impacts and effectiveness of related spending, such as agri-environment programmes or less-favoured areas support. This understanding cannot be restricted to selected areas only, but necessarily needs to be achieved from an overall European level to channel resources most effectively. A lot of funding will be made available over the course of the next years via the European Agriculture Fund for Rural Development, the European Regional Development Fund, the European Fisheries Fund and the Life+-regulation. It will shape the development of Europe's landscape considerably.

On the other hand, setting stricter intervention priorities needs a common agreement about the long-term objectives for agriculture and rural development. What kind of agriculture do we want to have in the future – concentrated and intensive or area-wide and extensive? What should be the prospects for rural development – creating rather equal, similar framework conditions of development in all regions or differentiating framework conditions of development according to regional differences?

These are difficult questions: There is no easy blue-print on the shelf that is going to provide the answers. Rather it needs a process of continuous research, analysis and discussion, with different experts and stakeholders at different scales, from the local to the supranational context. Scenario development is a useful tool in this regard, as the experiences gained within the PRELUDE project underline: Here, a considerably large group of about thirty stakeholders and researchers from very diverse backgrounds managed to engage in a very open and constructive discussion about potential future developments whereby many participants gained

new insights and challenged their own assumptions. The scenario framework thus was an effective bridge between science and society. Bringing together this group also helped to generate original, new knowledge beyond the classical domains of more traditional academic research. Furthermore, not only did all stakeholders develop a strong sense of ownership for the scenarios – and some of them brought them back into their own working environment – but the participatory character of the scenario development helped to ensure a strong legitimacy and credibility of the scenarios among other target groups.

Engaging a variety of stakeholders in a more continuous, open-minded discussion process is an essential prerequisite for successfully mastering the challenge of mitigating and adapting to the challenges of climate change in biosphere reserves. However, through the EuroMAB network biosphere reserves can also contribute to the wider discussion, at least in three ways:

a) *Help to set stricter priorities spatial priorities for rural development:* In spite of serious improvements over the last years, there are major data gaps for species, habitats and related landscape parameters (EEA 2007b). Biosphere reserves can contribute by cross-checking and delivering relevant data. From a European perspective it is often quite difficult to get a comprehensive understanding of the state and outlook of Europe's natural environment, since relevant and comparable data are missing

b) *Help to find new approaches to monitor the effectiveness of programmes and measures:* Contributing data on the state of the environment and past developments is not enough. There is also an urgent need to get better information about the impacts of our policies and programmes, if we want to increase their effectiveness and efficiency which is an essential requirement. But evaluation is a difficult and sometimes cumbersome process that needs also a lot of regional and local knowledge. Biosphere reserves can play the role of a model region, or a test bed, not only for undertaking policy effectiveness evaluations of single programmes or measures (like for example agri-environment schemes) but also for experimenting with new, more integrated and participatory approaches of decision-making.

c) Help to come to a better agreement about key long-term objectives: Mitigating and adapting to climate change does not simply require an increase of current efforts. More or less, it requires radical changes in the way we live, produce and consume, in the medium-to long-term, affecting a number of sectors such as agriculture, energy, transport, industry, services including tourism but also household consumption.

Implementing far-reaching change will not be possible if it is not backed by a major societal consensus about the respective long-term objectives, which in turn requires discussions among key societal stakeholders. What kind of agriculture do we want to have in the future, for example? There is a need to step outside day-to-day political discussions and engage in a broader discussion about this and other related questions. Biosphere reserves are in a unique position to bring together diverse stakeholders to form opinions that can fruitfully enrich discussions in other regions and on the national and European scale.

4. References

CEC – Commission of the European Communities. (2005). *Winning the Battle against Climate Change.* Communication COM (2005)35 final.

EEA – European Environment Agency. (2007). *Land Use Scenarios – Modelling at a European scale.* Technical Report No. 9 / 2007. Copenhagen: EEA.

EEA. (2007). *Europe's environment. The fourth assessment.* State of the Environment Report No. 1/2007. Copenhagen: EEA.

Volkery, Axel; Ribeiro, Teresa; Henrichs, Thomas; Hoogeveen, Ybele. (2007, *forthcoming*). Your vision or my model? Lessons from developing participatory land use scenarios at a European scale. *Systemic Practice & Action Research* (special issue, edited by: Newig, Jens; Haberl, Helmut, Rothman, Dale and Pahl-Wostl, Claudia), *accepted for peer- review.*

How does the zonation of a biosphere reserve contribute to sustainable development?

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Abstract
The zonation is spelt out among the criteria of article 4 of the Statutory framework adopted by the General Conference of UNESCO, which provides definitions for the core area, buffer zone and transition area (UNESCO 1995). The zonation scheme is the landmark and the **identity** of biosphere reserves. It serves to **translate into space the challenges** which correspond to the three functions: conservation, development and logistic. It also allows adapting various tools to the field, according to each zone, such as regulation, contracts, scientific or technical support, coordination, etc.

The zonation **integrates conservation** of biodiversity as an **integral part of sustainable development**. Each **zone** plays a role in generating ecosystem services, employment opportunities, biodiversity conservation and sustainable development.

Defining the zonation is a **tool for negotiation of objectives** and land use planning among stakeholders when establishing a new biosphere reserve or **during the periodic review process.** It is a very useful tool - rather than a constraint – for thinking and acting.

Key words: *biosphere reserve, zonation, conservation, sustainable development, management*

1. What is biosphere reserves zonation?

The zonation is spelt out among the criteria of article 4 of the Statutory framework adopted by the General Conference of UNESCO in 1995.
It is formulated as follows:

(a) A **legally constituted** core area or areas devoted to **long-term protection**, according to the **conservation objectives** of the biosphere reserve, and of sufficient size to meet these objectives;
(b) A buffer zone or zones **clearly identified** and surrounding or continuous to the core or cores areas, where only activities compatible with the **conservation objectives** can take place;
(c) An outer transition area where **sustainable resources management** practices are promoted and developed.

Some key elements can be highlighted from this definition:

- the biosphere reserve must have long term conservation objectives (which are site specific and may differ from one biosphere reserve to another);

- the size of the core area (s) depends of the conservation objectives, and its conservation is reinforced by the buffer;

- the core area must be legally protected (but the degree of protection can vary, from a strict natural reserve to a national park for instance) In this respect, a NATURA 2000 area can either be part of the core or the buffer zone, depending on the conservation objective of the biosphere reserve;

- the transition area is not delimited, and its aim is the promotion of practices of sustainable resources management; this means that, depending on the nature and impact of the human activities, they will take place in zones which will vary in surface area. It also means that the integration of biosphere reserves into regional planning should be facilitated. Nothing forbids however, designing a limit, which will facilitate local communities to understand and develop a sense of ownership for the BR. This limit should be designed with local decision makers, who usually consider the UNESCO designation provides prestige for their region.

2. Is biosphere reserve zonation still valid?

The first question that could be asked is whether such a scheme is still needed with the evolution of biosphere reserves towards territories devoted to test and implement sustainable development, in the context of global change, especially climatic, which was not yet evident in the eighties. And, if so, **whether the definitions of each zone** are still valid.

Several elements of reply can be proposed:

2.1 The zonation scheme, with the three zones, is the landmark and the **identity** of biosphere reserves and is recognized as such.

2.2 This scheme has had an **enormous influence** on the evolution of the concept of biodiversity conservation and is acknowledged as such.

A very interesting paper by the Director General of IUCN (Marton-Lefevre, 2007) can be quoted in this respect: “Biosphere reserves have played a seminal role in influencing the development of tools that are essential in achieving the key goals contained in Agenda 21 as well as a number of international Conventions […] In all these agreements the need to insure adequate planning and management of

biodiversity is of paramount importance. They call for proper ecological zoning and management system that responds to the environmental and socio-economic needs of each particular area. Both concepts, zoning and management, have been tested in biosphere reserves all over the world […] Moreover, the idea of having core zones in which protection is enhanced through the establishment of buffer zones […] has led to a number of crucial principles [such as] the development of biological corridors and other forms of ecological connectivity […] There is little doubt that the experience obtained from the management of biosphere reserves in relation to zoning and connectivity have greatly influenced the concept and the application of the ecosystem approach."

2.3 Research in the biological and conservation sciences, as well as the work which has been done in the field of metapopulations and landscape ecology, show the importance of **following a spatial pattern** for conservation, similar to the zonation of biosphere reserves. In other words, it ensures the conservation of interconnected populations which are the hubs in a matrix having ecological function, such as permeability.

2.4 In view of land use planning, the zonation serves to translate **into space the challenges** which correspond to the three functions: conservation, development and logistic. It also allows to adapt various tools to the field, according to each zone, such as regulation, contracts, scientific or technical support, coordination, etc (Figure 1).

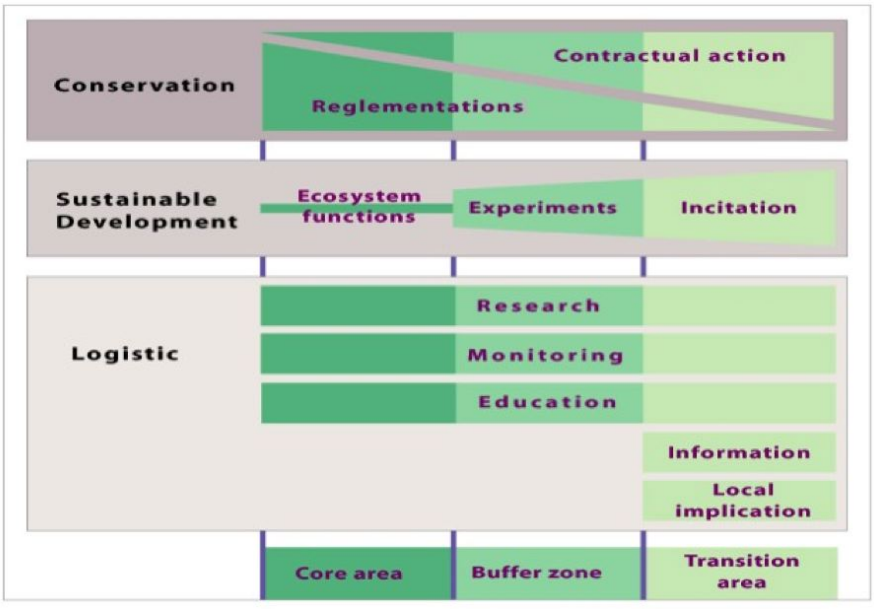

Figure-1. Zoning and functions in biosphere reserves
(from Cibien C.,Bioret F.,and Génot 2005)

2.5 The BR zoning system **integrates conservation** of biodiversity as an **integral part of sustainable development**. In particular, in terms of conservation, cluster biosphere reserves (i.e.with several core areas) allow the application of various conservation tools, with different degrees of binding force, within the context of various challenges, which constitute an integrated regional management scheme.

For instance, in the French part of the Vosges du Nord - Pfalzerwald transboundary biosphere reserve (Figure 2), core areas are protected under different regulations: natural reserve, Réserve biologique intégrale, arrête de biotope, which limit access and use according to the local challenges of conservation: protection of birds inscribed on European lists of protected species, during some part of their biological cycle; unbridled development of forest dynamics; or protection of peat bogs. This flexibility is even more interesting in a transborder framework, where the zoning provides a common tool for different national systems.

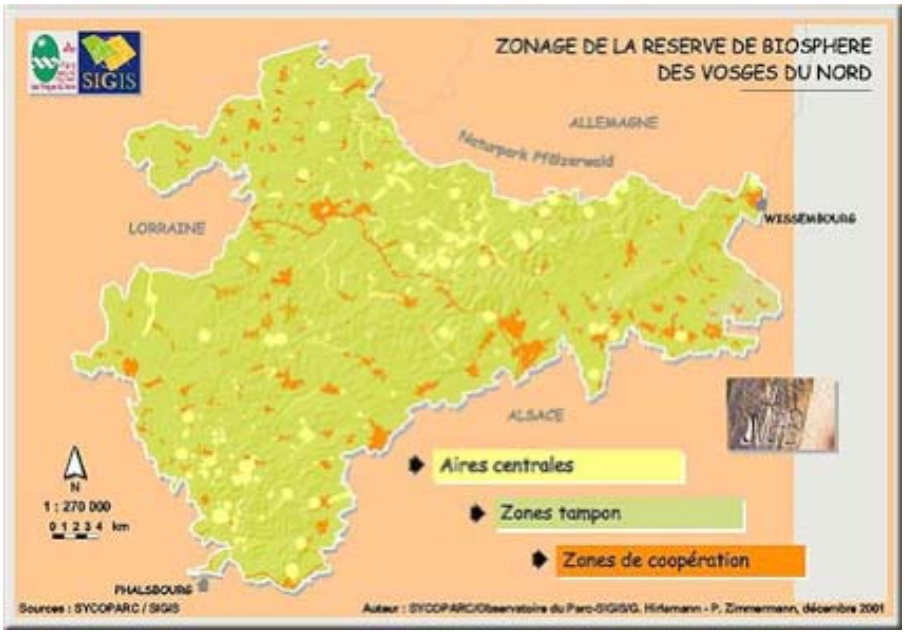

Figure-2. Zonation of the French part of Vosges du Nord - Pfälzerwald Transboundary Biosphere Reserve

In the same French part of this Transboundary Biosphere Reserve, which consists mainly of forest, the buffer respond to an objective of sustainable management: while the core areas are small, the buffer is very extended and corresponds to an area for which the authority of the biosphere reserve has signed a convention with the owners of the forest (private or public) in which a series of principles for

management are defined to respect biodiversity. The reduced transition area includes towns and villages and responds to the primary objective of sustainable development.

Some **other examples of zonation** in the French biosphere reserves can also be provided to illustrate the flexibility of the tool: indeed, the definition of each category of zones varies greatly from a site to another. In the Mer d'Iroise (Figure 3), an insular BR, core and buffer zones are

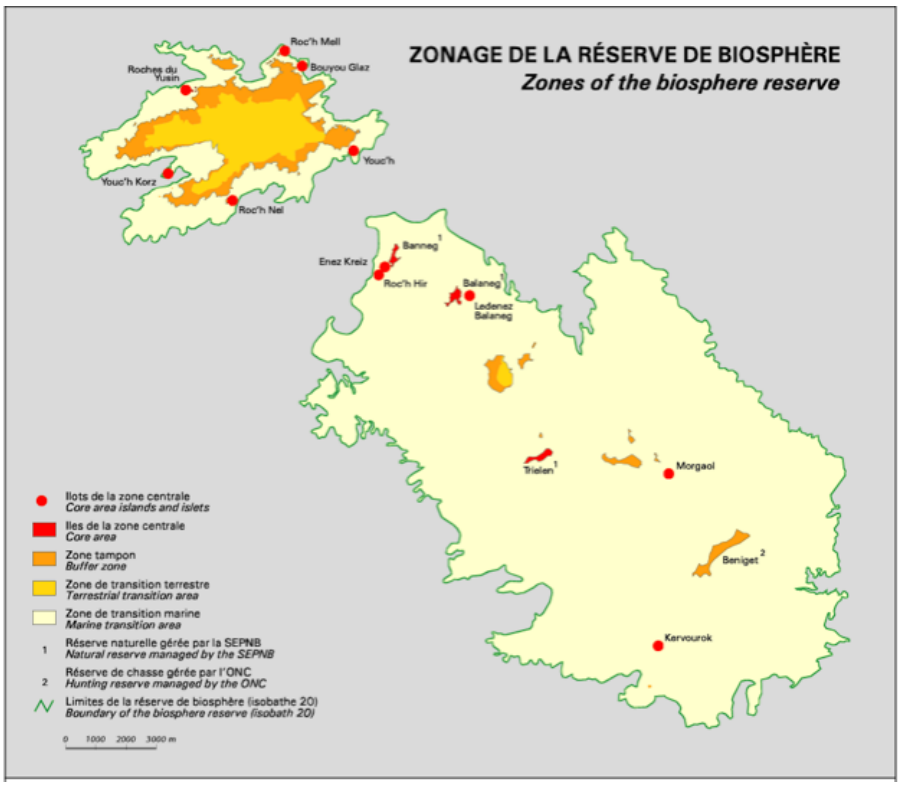

Figure-3. Zonation of "Mer d'Iroise" Biosphere Reserve (France)

located in the periphery of the transition, which can be seen as a paradox. A core area in the marine zone will be established with the designation of a new protected area (parc naturel marin) between the islands, thus the zoning will link several protected terrestrial areas, and a marine one.

2.6 The core area serves also as a **sample** to compare the evolution of the ecosystems with those of the other sections of the biosphere reserve undergoing various human pressures. It therefore contributes to the monitoring function.

2.7 The need for a **legally** protected area as core is justified because there is no place where the long term conservation objectives can be met with a complete absence of regulation.

In Europe, regulations are in general accompanied by incentives which help to the management of the area. Other types of policies such as contractual agreements complement the regulations.

3. Current issues for zonation

The main issues and questions raised in the MAB Secretariat's presentation (see http://www.unesco.org/mab, then forum discussion, then euromab Antalya, then thematic issue 3) of the theme can be reviewed in the light of French experience:

3.1. What are the **roles of each zone** in generating ecosystem services, employment opportunities, biodiversity conservation and sustainable development?

The biosphere reserve as a whole contributes to these elements (Figure 1). But each zone, in its specific and complementary way, brings elements to the whole: for instance, the core area contributes in providing ecosystems services, supply of clean air and water, soil stabilization, etc. It also provides employment opportunities through recreation or ecotourism, or is used for research and monitoring which will help better understand and managed the territory of the biosphere reserve. The buffer zone contributes to the conservation of biodiversity, is a zone of restoration or rehabilitation, and maintains traditional land and resource uses. As for transition areas, in which the main activities of development take place, they obviously are the main places for testing and learning sustainable development practices, while they also contribute to conservation, for example of agro-ecological systems or urban green belts.

Core areas have indeed a conservation function, but also an essential economic one, in view of the ecosystems services they provide: in Guadeloupe (Figure 4), the strict protection of the marine zone, (Reserve naturelle du Grand cul de sac marin, one of the core areas) is the place for fish and lobsters breeding, which is the main basis for fishing in the transition zone. The conservation of the core area depends on agricultural practices and urbanization in the catchment area where pollution will threaten these resources. The manager of a natural reserve has no legitimacy to intervene outside the reserves, while the manager of the core area of a biosphere reserve has such legitimacy.

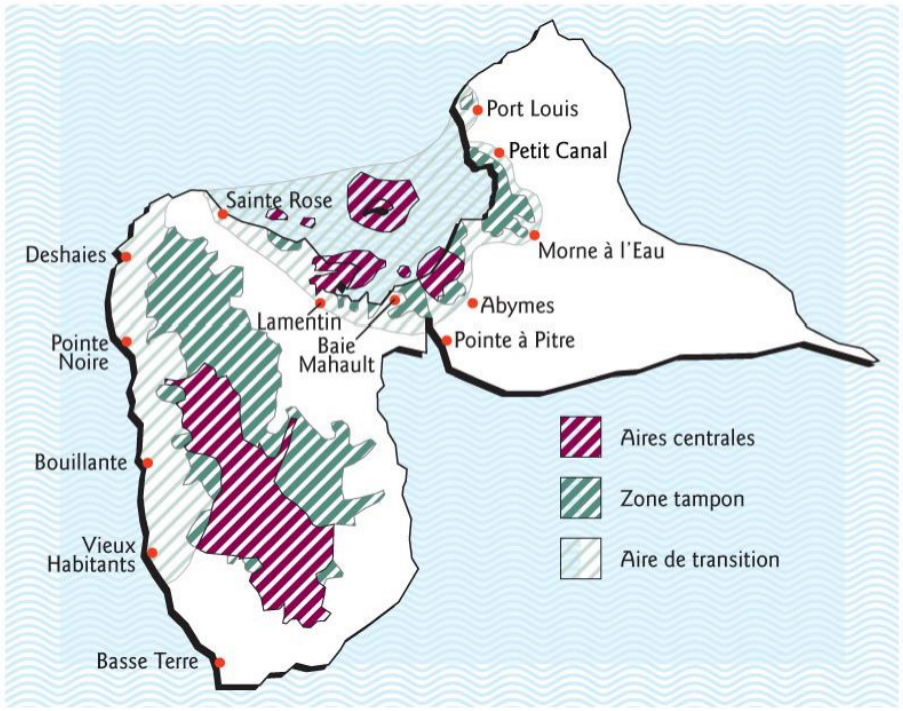

Figure-4. Zonation of "Archipel de Guadeloupe" Biosphere Reserve (France)

Another example concerns the Mont Ventoux Biosphere reserve where core and buffer zones constitute the water reserve of the Provence Region, providing water to millions of inhabitants.

This illustrates how each zone contributes to conservation and development taking into consideration constraints and opportunities inherent in each zone.

3.2. How is the **zonation adapted to local and national legislation** and governance structure and processes?

The zonation in France has been adapted not only to one type of legislation, but to combine several: national parks, Nature regional parks, nature reserves, protection of biotopes, etc. Also the governance of each site depends on the host structure: in the case where a regional park has become also a biosphere reserve, the management structure is the same. When the biosphere reserve is more extended than the regional Park, the structure has been adapted to include other partners: this is the case of the newly revised Camargue Biosphere reserve (Figure 5).

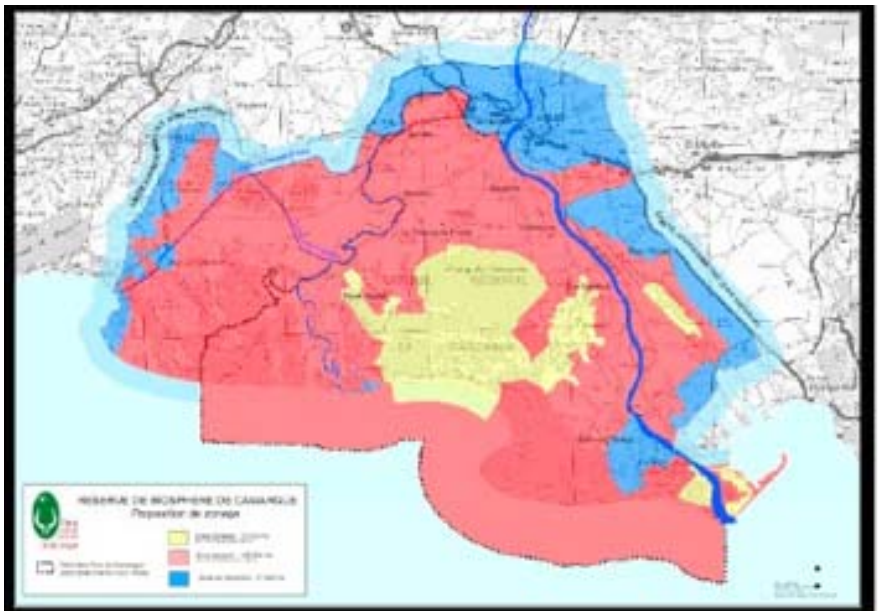

Figure-5. Zonation of Camargue - delta du Rhône Biosphere Reserve (France)

If the biosphere reserve is established in the framework of a national park, the manager of the park also acts as the authority for the coordination of the biosphere reserve, but with extended competencies with respect to a larger territory (case of Guadeloupe). In the Cévennes Biosphere reserve, which was established on a national park, a specific consultative commission devoted to local involvement and development was created, to respond specifically to the BR objectives (this does not exist in other national parks).

3.3. How is **the zonation scheme interpreted/reinterpreted** vis à vis the dynamics of socio-ecological systems (including urbanization) and changes (including climate change)? What lessons can be shared from interpreting the zonation scheme for sustainable development in different settings (from protected areas to heavily settled urban regions)?

The zonation system foster solidarity among rural areas, natural zones and urban area. For instance, in the Fontainebleau Biosphere reserve, where the core and buffer zones constitute the clean air reserve of Paris, and offers opportunities of recreational activities. Or in the Cevennes, where the notion of "partner cities" has been put in place in the Mediterranean coast, with numerous inhabitants taking advantage of the hinterland, water and wood resources, etc.

3.4 How can these lessons, experiences and changes over time and space be taken into account? Are there **mechanisms needed to revise** the zonation? Is the periodic review process the right tool?

The answer to this last question relates to the importance of the role that the definition of the zonation can play as a **tool for negotiation of objectives** and land use planning among stakeholders. In general terms, the creation and the management of a biosphere reserve and of its natural resources must result from a participatory approach, which implies that the various groups are not only consulted but associated in all decisions pertaining to it. With reference to the 1st and 2nd principle of the Ecosystem approach: "The objectives of management of land, water and living resources are a matter of societal choice. Management should be decentralized to the lowest appropriate level", the French MAB Committee promoted a guide for BR management after the Seville Conference which has been recently updated by the ARDI approach (Actors, resources, dynamics, interactions). It is based on the co-building of management objectives (conservation, development, research and training) of a biosphere reserve by the main stakeholders.

Once the challenges have been defined in the context of this collective work, then the zonation can be discussed and defined.

This approach is particularly useful when the BR is established or **during the periodic review process.**

It is the way by which the Camargue biosphere reserve (Figure 5), a first generation BR designed in 1977, constituted by a nature reserve of 14000 ha, has moved forward to a fully functional BR of 160000 ha with a population of 110000 to 220 000 (in summer time).

Other French biosphere reserves have been subject to the periodic review. This process was the occasion for a complete redefinition of the territory concerned, the design of the zones and in-depth discussion with all partners, sometimes antagonists, as well as the constitution of a new mechanism for the management of the area. For biosphere reserves undergoing periodic review in 2008 and 2009, the same methodology will be applied.

In other cases, the establishment or the revision of a biosphere reserve has not only led to a complete revision of the zonation, but also to the creation of new and adapted structure for the coordination and the management of the area. This is the case in the Commune of Fakarava biosphere reserve, in the Pacific region, where an association has been constituted to include representatives of all relevant groups of stakeholders.

4. Conclusion

Biosphere reserves are recognized as models for management. The concept has become mature and the zonation is one of its landmarks, together with the three integrated functions. Its flexibility is recognized, and the zonation pattern is a very useful tool - rather than a constraint – for thinking and acting. This basis (the zonation) is still valid in view of new challenges, in particular global change. It can be adapted to face new problems, but should not, be drastically modified.

Progress on the implementation of the concept are certainly needed: first, on the issue of dialogue and governance, and second on the inter-relations between research/innovation and management, as the socio-ecological systems face rapid and important changes and will have to be managed in an adaptative and open manner. This also confirms the importance of periodic reviews which can be considered as key steps in a biosphere reserve's life ad for which methodologies and evaluation tools must be developed.

5. References

Cibien, C., Bioret, F. et Génot, J.C. 2005 : les rbs comme outils d'aménagement du territoire. Forum des gestionnaires. Paris.

UNESCO 1995. Réserves de biosphère: La stratégie de Séville et le Cadre statutaire du Réseau mondial. UNESCO. Paris.

Marton-Lefevre J. 2007. Biosphere reserves – A visionary tool for adressing today's challenges. UNESCO today (2)10-12.

Identity and development issues for Biosphere Reserves

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Abstract
One of the purposes of the Man and Biosphere reserves is to incentive socioeconomic development in the Biosphere Reserves. One part of this topic is about marking the products. In the rising system of environmental labels and marks, the French MAB committee is implementing a sign of quality for the Biosphere Reserves, a charter based on the identity of the place. This article is based on the following argument: in order to gather the population around the Biosphere Reserves, working on the identity of the territory may be a way to canalise its development.

Key words: *Identity, charter, values, patrimony, social control*

1. Introduction

In this intervention, I want to present a project initiated in the Biosphere Reserve (BR) of the Mount Ventoux, in the south east of France. In the current dynamic of increasing signs of quality for environmental actions as labels or marks for instance, we are developing on the Mount Ventoux's BR a charter based on identity. I will first present the principles of the project, then move to the methodology and tools mobilised, and finish on the current stakes for the consolidation of the process.

2. From technique to identity for the Biosphere Reserves

2.1. Biosphere Reserves and development

Ignacy Sachs, who was one of the pioneers in taking into account environmental problems in development, has a sentence that could introduce the perspective of the Mount Ventoux's experimentation: "*More than transformation, development is invention. It contains an element of intentionality, the ability to be conscious that we are the main piece of development*"[1].

The Man And Biosphere (MAB) program took a new direction after the meeting of Seville. As a result of this new policy, an effort was made to give the

[1] Sachs I, « l'imagination et le savoir, le développement selon Celso Furtado » *Cahiers contemporain du Brésil*, 33,34, 179-183, 1998, p180

opportunity to inhabitants of BR to seize this international tool. This was concretised by a closer relationship between scientists and managers of the BRs. In order to make a global balance of these 30 years of living of the BR, Catherine Cibien, national secretary of the French MAB, summarizes in this way "*In thirty years, Biosphere reserves, from biological reserves and workshops imagined by scientists for long term research on management of natural resources also became complex tools of integrated administration and land management, for local population*"[1]. The other step, inscribed in the schedule of the Seville's strategy, is the implication of local population more globally.

2.2. Shared history of the place and values

That's where the project of the charter of the BR of the Mount Ventoux emerges. The institutional issue of the research made on the Mount Ventoux was to imagine a new way to strengthen the Biosphere Reserves as a support for the development of a territory as other Biosphere Reserves in other countries have implemented or are implementing. The specific question we brought in the French context, remembering the sentence of Ignacy Sachs is: How can population valorise the diversity of Biosphere Reserves, as a blend of natural and social history? How to give coherence to this diversity? On this subject, French MAB committee thought about the construction of the identity of the BR. What does it mean? It's mostly seeking the system of values inherited from the shared history of the place. This principle, proposed by Jacques Weber, vice president of the French MAB committee**,** comes from the fact that every society possesses a system of classification of the world, that is to say things, humans, non humans and the relations between these entities[2]. This normative system gives a heavy long path for the relative society.

Consequently, given this perspective, the idea of the charter is first of all a social experimentation before a technical experimentation. I don't mean that technical aspects, such as economic and administrative, have to be put aside for the development of the project. But the first step is to gather people around this historical patrimony, to create a collective entity. For Yves Schwartz[3], a French historian, we can always find collective entities relatively pertinent.The issue is to know to what extent it is a patrimonial group. That is to say, strickly speaking, the ability of this group to valorate or devalorate this patrimony. If we are talking about the historical knowledge on the territory of the BR, we are indeed on a pertinent patrimony.

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[1] Cibien C, « Les réserves de biosphère : des lieux de collaboration entre chercheurs et gestionnaires en faveur de la biodiversité », *Natures Sciences Sociétés*, 14, 84-90, 2006, p85

[2] Weber J, Bailly D, « Prévoir c'est gouverner », in *Sciences Natures sociétés*, I 1, 59-64, 1993, p4

[3] Schwartz Y « Les entités pertinentes de l'action collective », in *L'action collective, Coordination - planification – conseil*, Tosel A & Damien R (Dir.), 2036-247, 1998, p213

3. The construction of identity in the Biosphere reserve of the Mount Ventoux

3.1. The research of common values

Going back to the Ventoux, the project of valorisation of the BR is 10 years old. Five studies were made and some economic and political actors have participated since the beginning. The first trend was to create a mark[1]. Then the focus moved to the idea of the charter exposed before[2], principally working on financial schedule, actions of communication, management structure. We can see that indeed these organisational aspects, technical aspects, are important. Definitely it is part of the process. It helps build a prospective of the project. Now, in the public construction of the charter, we have to make an effort on shaping the identity of the BR.

Then the question is: how to work on the common values that fund the identity of the BR? This task demands to move to a very long scale, in other words, the very long future of the territory. Consequently, by definition, we talk about scenarios. And as a matter of fact, the system of values participates to the elaboration of the scenarios. It's by moving towards long term evolution that we are able come back to present time, being aware of these values. That is a way to be prepared in confronting the evolution of the territory. Facing the current possibilities**,** different choices are identified. Social sciences can be mobilised for such purpose by expertise.

I just want to make a small parenthesis on this involvement of social sciences by expertise. It is a double movement. One is to confronte sociological or anthropological knowledge to actions. The other is to keep that experience for a scientific analysis, this circular movement going on so forth. And I think this shows the possible articulation between pragmatism and research. In the context of the charter, this participative observation can help to reach common values. The relationship with local actors is on the one hand negotiation, the action side; and on the other familiar talks, talks on the future of the territory often linked with individual and collective stories, one of the principal materials for anthropological analysis.

Bianco J-P, Sippel F, *Proposition de valorisation des produits de la réserve de biosphère du Mont Ventoux*, SMAEMV , Université d'Avignon et des pays de Vaucluse, 1995

Canes J-C, Sanchez F, *Création d'un signe de qualité pour les produits du Mont Ventoux*, ISEMA, 2000

[2] Mercier J, Montély M-A, Scheyer L, Straistaru O, *Une charte pour les réserves de biosphère française* , ENGREF, 2006

Brondino L, *Etude de faisabilité d'une charte des entreprises de la réserve de biosphère du Mont Ventoux*, ENSA RENNES, 2006

3.2. The stake of control

Now that we have described this work to identify common values, the next issue is the consolidation of the process.Clearly, this kind of project; which conclusion is economic, can generate or dynamise conflicts and utilitarist behaviours. How to control the environmental actions in the project of the charter?

The solution may be the social control based on historical social relationships. In the French context, local actors have to face a lot of procedures to reach signs of quality. First of all, developing the same kind of procedure for the BR charter would be a non sense. Owing to that, how to be confident with the social control? The investigation showed that the scenarios developed by local actors to think the evolution of the territory are a way to distinguish different social groups. Containing many technical aspects these scenarios reveal the existing or potential conflicts. If conflicts are inherent to social relations, the debate on technical scenarios is a way to canalise conflicts on the purpose of the charter that is to say streghten the terrirory and its identity.

4. Conclusion

As a conclusion, I can go as far as to say**,** to synthetise, that the main issue in this kind of project is to work on social history to have ulterior socioeconomic benefits, in the BRs. Before reaching technical and financial resources at a local scale, it could be important to work at the consciousness of these values. This knowledge can give a hand to control economic development and increase human well being in the BR in a short and long term.

5. References

Bianco J-P, Sippel F, *Proposition de valorisation des produits de la réserve de biosphère du Mont Ventoux*, SMAEMV, Université d'Avignon et des pays de Vaucluse, 1995

Brondino L, *Etude de faisabilité d'une charte des entreprises de la réserve de biosphère du Mont Ventoux*, ENSA RENNES, 2006

Canes J-C, Sanchez F, *Création d'un signe de qualité pour les produits du Mont Ventoux*, ISEMA, 2000

Cibien C, « Les réserves de biosphère : des lieux de collaboration entre chercheurs et gestionnaires en faveur de la biodiversité », *Natures Sciences Sociétés*, 14, 84-90, 2006

Mercier J, Montély M-A, Scheyer L, Straistaru O, *Une charte pour les réserves de biosphère française*, ENGREF, 2006

Sachs I, « l'imagination et le savoir, le développement selon Celso Furtado » *Cahiers contemporain du Brésil*, 33,34, 179-183, 1998

Schwartz Y « Les entités pertinentes de l'action collective », in *L'action collective, Coordination – planification – conseil*, Tosel A & Damien R (Dir.), 2036-247, 1998

Weber J, Bailly D, « Prévoir c'est gouverner », in *Sciences Natures sociétés*, I 1, 59-64, 1993

Nature, Law, and Landscape: Planning for a World of Cities*

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1. Introduction

We are becoming a world of cities. According to United Nations estimates, the urban population of the world is about to surpass that of rural areas for the first time ever (http://esa.un.org/unpp/). In 1900 only one-tenth of the world's population—some 160 million people—was classified as "urban." Today about 3.2 billion people inhabit cities, suburbs, and "informal settlements" (aka slums), a twenty-fold increase in a century. Moreover, as the world grows to possibly 8.2 billion by 2030, virtually all further growth will be concentrated in urban areas, principally in Asia, Africa, and Latin America. From Sao Paulo to Lagos to Istanbul to Karachi, cities of the developing world will continue to explode with foreign and domestic immigration, as well as natural increase where birth rates exceed mortality.

What does this mean for the future of humankind? There may be some benefits: cities have historically fostered opportunity and upward mobility for the fortunate and higher densities allow public services to be provided more efficiently. But hyper-urbanization in developing nations poses daunting environmental, socioeconomic, and political threats. Environmental implications include resource scarcity (e.g., arable land, water, energy, timber), habitat degradation and loss of ecological services, climate change, and increased vulnerability to natural disasters. These in turn influence economic, social, and political conditions, including housing and jobs, health care, social inequity, and political instability.

2. A Model of Social Adaptation

How do societies learn (or fail to learn) how to build and restructure urban communities, small and large, to become safer, healthier, more efficient, and more

* This paper was presented at the EuroMAB Antalya Conference, Nov. 12-15, 2007 as the keynote address for Panel 5. The author is Professor of Geography Emeritus at the University of Massachusetts Amherst, USA and director of the Ecological Cities Project (http://www.humanemetropolis.org/). Dr. Azime Tezer, Assistant Professor in the Urban and Regional Planning Department, Istanbul Technical University, contributed to the discussion of Istanbul and Omerli Watershed.

habitable. Figure 1 represents a general model of "Land Use and Society" depicting the interaction between the natural world, human societies, and the landscapes created by humans.

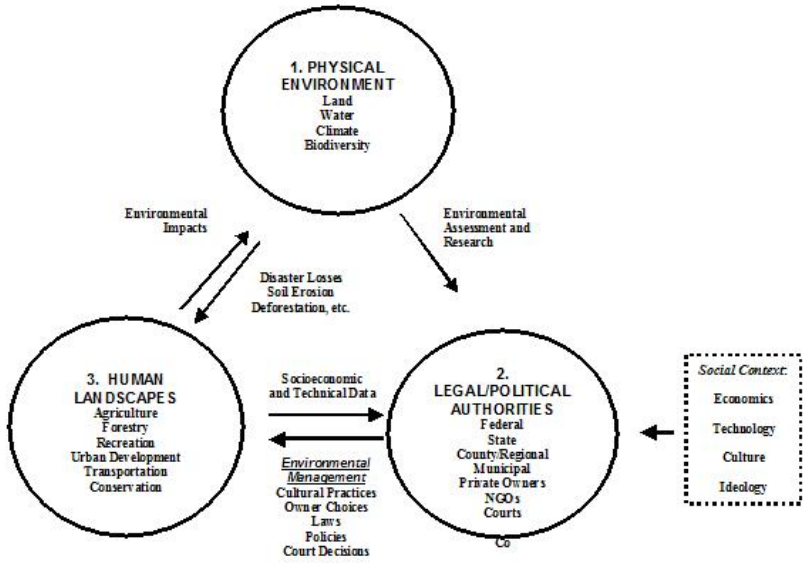

Figure-1. The Land Use and Society Model (*Source: Rutherford H. Platt, Land Use and Society:Geography, Law, and Public Policy.Island Press, 2004).*

The model depicts three sets of spatial or "geographic" data that interact over time to determine how humans manage or abuse land, water, and the rest of the biosphere. Circle 1 represents the "physical environment" including geology, soils, hydrology, ecology, and climate. Circle 2 represents the spatial distribution of political and legal authority, including private ownership, governance at various scales, and the judiciary system for resolving disputes. Circle 3 represents spatial patterns of land and water use such as agriculture, mining, forestry, recreation, conservation, and urbanization, which geographers collectively refer to as the "human landscape."

It should be obvious that Circle 3 landscapes result from exploitation and modification of Circle 1 physical environments by Circle 2 decisionmakers. However, this is not a static linear process. Practices and patterns of land and water use once started are not immutable or we would all be nomadic hunters and gatherers. Over time, Circle 2 decisionmakers undergo a "learning process" based significantly on new information about Circles 1 and 3, along with changes in

technology, the economy, culture, ideology, and other variables. The learning process, which involves complex interaction among private, public, and often judicial decisionmakers, yields changing practices, policies, and rules--here represented by the "land use decisions" arrow--that collectively determine the way Circle 1 physical resources are organized in Circle 3 human land and water uses.

3. Learning to Adapt in 19th Century Industrial Cities

This process is longstanding, extending back as long as there have been societies that organize the use of land and other resources. Among many examples from history, the rapid growth of industrial cities during the 19th Century was roughly comparable in rate and consequences to contemporary city expansion in developing countries (Table 1).

Table-1a. Selected Industrial Cities Growth: 1800-1890)[a] (*Source: adapted from Weber, 1899)*

	1800	1850	1890	1850-90 Annual Growth Rate
London	860,000	1.7 mill.	5 mill.	4.8%
Paris	547,000	1.0 mill.	2.4 mill.	3.5%
New York	62,500	660,000	2.7 mill.	7.7%

Table -1b. Post-Industrial Cities Growth 1950-2000b
(*Source: Adapted from New York Times Almanac-2003, p. 47*)

	1950	2000	1950-2000 Annual Growth Rate
Tokyo	6.9 mill.	26.4 mill.	5.6%
Mexico City	3.1 mill.	18.1 mill.	9.6%
Jakarta	3.0 mill.	11.0 mill.	5.3%
Cairo	2.4 mill.	10.6 mill.	2.5%
Bombay	2.9 mill.	18.1 mill.	6.8%
Istanbul	1.2 mill.	10.0 mill.	3.5%

Nineteenth Century rapid city growth produced widespread tenement areas with factory workers living in unsanitary, crowded, and fire-prone dwellings often without access to clean water, waste removal, fresh air, and exercise. As

epidemics and fires swept through densely built-up communities, the wealthy were endangered along with the poor. Resulting Investigations of the physical conditions responsible for the breakdown of public health and safety led to a series of new laws and other measures in England, France, Germany, and the United States. The three major approaches pioneered at this time, and continuing into the 20th Century included:

1. Regulation of sanitation, building standards, and public health conditions;

2. Redevelopment of cities to provide paved streets, lighting, public water andsewer systems, parks, and other improvements;

3. Relocation of some urban dwellers to new "model communities" outside the cities (Platt 2004, Ch. 6).

As one example, New York City, during its era of most rapid growth and expansion (1800-1850), proved to be a model of urban leadership, innovation, and self-improvement which may still inspire fast-growing megacities today. During that half-century, New York's rapid growth resulted from its role as the primary North American center of commerce, culture, and ethnic assimilation. It easily eclipsed its colonial rivals, Boston, Philadelphia, and Baltimore as a port of entry and trade. And with the opening of the Erie Canal that linked the Hudson River to the Great Lakes in 1825, New York's great harbor became the primary gateway and entrepôt to the vast Middle Western hinterland beyond the Appalachian Mountains.

Its rapid growth, however, brought many urban perils including fire, epidemics, civil unrest, overcrowding of housing, traffic congestion, irregular street patterns, and lack of clean water and open space, very much like threats afflicting large cities in developing countries today. To a remarkable extent, the city's political and intellectual leadership in the early 19th Century managed to respond to many of the city's challenges through bold, innovative, and often costly remedial measures. Among many urban improvements of that era, two examples may be briefly summarized here: development of an external water system, and the building of Central Park.

Croton River Water System. The continuous outbreak of fires and water-related epidemics during the 1820s and 1830s forced city leadership of New York to confront the inadequacy of its local water sources. Other than local wells long since polluted by privies, the only source at the start of the century was a privately-chartered water company serving a limited part of the city with very unhealthy water. In 1832, civil engineer DeWitt Clinton, Jr. was retained by the city to assess the water crisis and propose a solution. His report predicted that

Manhattan would reach a population of 1 million by 1890 (he was late by 12 years). His proposal was simple in concept and vast in magnitude, namely, to tap the Croton River 50 kilometers north of the city to obtain a reliable supply of pure upland water. The elevation of a Croton River reservoir above sea level would permit the water to flow to the city by gravity through an aqueduct

The Croton River project required the construction of a storage dam, a 50-kilometer tunnel, a bridge, a receiving reservoir, and a distribution system—in short, a project unprecedented in magnitude since the Roman Empire. With the total cost estimated at several million dollars, the project was too large and important for private enterprise. Accordingly, the City of New York, under authority from the state legislature, undertook to plan and execute the Croton River project directly. A water commission was quickly appointed, financing was approved by the city's voters and construction began in 1837. The first Croton water reached the city in 1842, an event marked by church bells, cannon firing, and a huge parade. This project would in turn serve as a model for Boston which inaugurated its own external water supply in 1848 (Weidner, 1974).

Central Park. Public health reformers also called for new parks to serve the swelling working class population of New York. This concept reinforced proposals from the city's intellectual and artistic elite dating back at least to the 1830s to establish a "Central Park" of very large size before all of Manhattan was covered with streets and buildings. After prolonged lobbying by park advocates, the New York State Legislature in 1853 authorized the city to establish Central Park. It was originally to comprise a rectangle of 770 acres, including space for two reservoirs to receive water from the new Croton system (later expanded to 843 acres).

The conversion of this huge and squalid tract of land into one of the world's great urban parks was the triumph of America's first landscape architect, Frederick Law Olmsted. The 1858 *Greensward Plan* by Olmsted and Calvert Vaux was selected by the city pursuant to a design competition. The Plan involved replanting of woods and meadows, and creation of water bodies (one of which was the Croton receiving reservoir). Separate systems of walkways and drives ensured that pedestrians, horseback riders, and carriages did not conflict with each other (Olmsted, F. L., Jr. and T. Kimball. 1928/1973).

The building of Central Park was the largest public work yet undertaken in the City of New York, involving thousands of jobs and millions of dollars. From its inception, Central Park was a practical success. Olmsted and Vaux sought to encourage active use in many ways, such as horseback riding, boating, carriage driving, skating, cycling, and strolling. Open meadows, rocky outcrops, wooded areas, and water surfaces.Tofday these features are lovingly cherished by New

Yorkers and millions of others who visit this created "rural" landscape in the very heart of the nation's largest city every year.

The Croton reservoir system and Central Park were each successful and lasting examples of how New York City adapted to its rapid early 19th Century growth. New York pioneered new forms of public administration, new financing measures, and the use of new technology in providing itself with basic urban infrastructure and services. Such past exxperience demonstrates the ability of societies to shape and improve their urban communities.

4. Nature in the 21st Century City

How does this adaptation process apply to today's hyper-urbanizing cities? Four key perspectives are slowly gaining acceptance in cities around the world that point toward making cities more sustainable and habitable. First, Nature matters: cities ignore at their peril the loss of ecological services such as water purification, flood mitigation, carbon squestration, and moderation of microclimate. Second, recovering natural processes and functions requires regional approaches based on biophysical rather than political boundaries. Third, public initiatives must serve multiple goals: single mission programs and agencies are wasteful and often counterproductive. Fourth, cities and regions must assume leadership in providing for their future habitability, with national governments ideally playing a supportive role.

These perspectives underlie current discussions in Istanbul regarding the critical Omerli Watershed. Metropolitan Istanbul today is a megacity equivalent to New York and its inner suburbs with about 12 million inhabitants. But unlike New York, in 1970 it was merely one-fourth its present population size with three million residents, and it is predicted to reach 22 million by 2025, a seven-fold increase in half a century.

In the face of such astonishing growth, one of many critical needs is to conserve existing water sources to serve ever-larger demand since new sources may not be available. A quarter of Istanbul's water supply today is derived from the Omerli Reservoir on the Asian side of the Bosphorus. The 608 square-kilometer Omerli watershed is experiencing widespread illegal construction of ramshackle apartment buildings driven by Istanbul's desperate shortage of housing units. This unplanned wave of construction, much of it on public land, threatens to pollute the reservoir as well as destroy a distinctive heath ecosystem which nurtures a rich variety of endangered flora and fauna which adjoin it (Tezer, 2005)

The Omerli Watershed crisis was the focus of a workshop for public officials, planners, and scientists organized by Dr. Azime Tezer, a planning professor at Istanbul Technical University. To elevate the status of the watershed as a prime

water source and natural ecosystem, members of the workshop urged that Turkey nominate it to UNESCO for designation as an "Urban Biosphere Reserve." If this succeeds, it would be one of the first such units to be created in an urban setting; UNESCO's global network of some 400 "biosphere reserves" established to date are primarily remote from cities.

The concept of urban biosphere reserves was further elaborated at the UNESCO EuroMAB "Bridging Science and Society" Conference Nov. 12-15, 2007 in the historic city of Antalya, Turkey. The conference involved national representatives, scientists, and project managers from Madrid to Moscow who shared experience with biosphere reserves in a highly urbanized continent. Natural area protection in Europe has been internationalized under the European Union's "Natura 2000" network which now encompasses 17 percent of the EU's land mass (http://www.natura.org/). Another bold vision is the European Greenbelt Initiative proposed by the World Conservation Union to extend 8,500 kilometers along the former "Iron Curtain" from the Barents to the Black Sea, touching on 23 nations (http://europeangreenbelt.org/). One element of the greenbelt is an intact natural floodplain along the Danube lying within Croatia, Hungary, and Serbia. As a small-scale example of trans-border cooperation, Slovenia's Sckocjan Caves National Park, a designated biosphere reserve, involves school children downstream in Italy in its environmental monitoring and education program.

These are a few examples among hundreds of projects seeking to protect or restore natural systems and functions within or close to large urban population centers. Recovering nature in megacities may sound less important than other desperate needs for housing, jobs, schools, health care, and public transportation. And yet, if a city ignores its natural setting and ecological support systems, it will not be sustainable.

5. References

Olmsted, F. L., Jr. and T. Kimball. 1928/1973. *Forty Years of Landscape Architecture: Central Park*. Cambridge: The M.I.T. Press.

Platt, R. H. 2004. *Land Use and Society: Geography, Law and PublicPolicy* (Revised Edition). Washington, DC: Island Press.

Tezer, A. 2005. *The Urban Biosphere Reserve (UBR) concept for sustainable use of urban aquatic habitats: the Omerli Watershed, Istanbul*, Ecohydrology & Hydrobiology Journal, Vol. 5, No 4, 311-322.

Weber, A. F. 1899/1963. *The Growth of Cities in the Nineteenth Century: A Study in Statistics*. Ithaca: Cornell University Press.

Thematic Issue - I

How to use biosphere reserve as learning sites for sustainable development and what contributions to the UN Decade of Education for Sustainable Development?

Background

The Seville Strategy introduced the idea of biosphere reserves as models for sustainable development (Goal II). The Third World Congress on Biosphere Reserves '**Biosphere Futures, UNESCO Biosphere Reserves for Sustainable Development'** (Madrid, Spain, 4-8 February 2008), will discuss how biosphere reserves can be better used for learning, governance, and adaptive management approaches for sustainable development of land/seascapes.

What will be the EuroMAB Network contribution to this global agenda and to the World Network of Biosphere Reserves in the next six years and during the UN Decade of Education for Sustainable Development (2005-2014)?

Key issues

1. How is the biosphere reserve addressing the full scope of sustainable development at local scale?
2. How is sustainability defined in local context, reflecting local conditions?
3. What specific actions for sustainable development are undertaken at local scale (BR) and at national level (MAB committee)?
4. What are the processes and habits for sharing knowledge? How is access to biodiversity and sustainable development data and information made possible? To whom? How this data can be used for education? What are the governance and sharing processes in the site?
5. How is the biosphere used for education activities on sustainable development? What type of activities and what partnerships?
6. How is the biosphere reserve making the linkages between science, policy and practice in order to generate usable and used knowledge for sustainable development?
7. What are your assessment methods to evaluate and measure the effect and effectiveness of biodiversity education and sustainable development inside and outside the site?
8. Are your using biosphere reserves as demonstration sites as regards the Aarhus Convention for participation, and public information? What tools are used to implement and assess participatory approaches, being considered as the basis for reaching sustainable development? What lessons to learn and to share for managing biodiversity and environment? What capacities are needed?
9. Are there any current or future work plans that may affect extent of or modalities for access to information, public participation in decision-making in your site?

Expected outputs

- Building a clearing house within EuroMAB on sustainable development defined in local contexts with examples of activities, practices, including participatory approaches, as well as sharing of pedagogical initiatives and supports for the UN Decade on Education for Sustainable Development;

- Experimenting innovative approaches and practices to sustainable development, including educative and capacity-building initiatives in biosphere reserves;

- Concrete recommendations for the EuroMAB action plan: Designing a strategy for sharing practices and initiatives through a) design of cooperative programmes between different BR's; b) schools twinnings; c) universities twinnings; d) higher education college cooperative exchanges with sustainable development modules; e) building partnerships using UNESCO UNITWIN Chairs, associated schools network, private sector

References

Madrid policy Paper (available end of September 2007)
UNDESD
http://portal.unesco.org/education/en/ev.php-URL_ID=27234&URL_DO=DO_TOPIC&URL_SECTION=201.html
EPRS Declaration on Education
http://www.unesco.org/science/forum/gforum.cgi?do=post_attachment;postatt_id=1;guest=1239953
Aarhus clearing house
http://aarhusclearinghouse.unece.org/index.cfm
http://unesdoc.unesco.org/images/0014/001465/146566e.pdf

Keynote Speaker: Per OLSSON, Biosphere Reserves as learning sites for sustainable development

Moderator: Rebecca POLLOCK

UNESCO Secretariat: Giorgio ADRIAN

Presentations:
Urkhan ALAKBAROV, "Ecocivil" Concept in Textbooks and Readings on Sustainable Human Development Published in Azerbaijan at 2003 – 2007

Birgit REUTZ-HORNSTEINER, How can protected areas offer local people a chance to participate and benefit? Protected Area Management and participation as key factors for the acceptance and the sustainable implementation of the "protected area idea" – the case study of the Biosphere Reserve Grosses Walsertal

Susanne STOLL-KLEEMANN and Rainer SCHLIEP, The Divergence between Orientation and Reality in BR Management – Lessons Learnt from Empirical Studies

Petr CUPA, Experience of the Lower Morava Biosphere Reserve in being a learning site for sustainable development

Rebecca POLLOCK, Case Study: Collaboration and Integration Experiences from Canada

Michele BIASUTTI, Biosphere Reserves as key places for testing educational methodologies

"Ecocivil" Concept in Textbooks and Readings on Sustainable Human Development Published in Azerbaijan at 2003 – 2007

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UN and UNESCO announced the 2005 – 2014 as decade on education for sustainable development (ESD). This document has been signed on March 1, 2005. The primary goal of this decision is the increasing of the awareness of population on environmental issues and training of the new generations of the decision makers and experts who will be equipped with the knowledge and skills necessary to plan and implement the ecologically friendly economic and social programs and projects. Knowledge based and human centered environmental planning is also the important element of the different territories, including biosphere reserves, management.

The learning tools on sustainable and human centered development education produce in Azerbaijan from 2001. Today different curriculums and textbooks for secondary and tertiary general education issued in Azerbaijan. Most of these learning tools are the world first (http://hdr.undp.org/nhdr/impact) and have been developed with active participation of the National MAB Committee. All curriculums and textbooks on SD (sustainable development) demonstrate that societal concerns about biodiversity conservation and sustainable mobilization of the natural resources have been recorded for many thousand years. One of the best examples is the story about Noah's Ark. Putting this story in the context of modern environmental concepts, Noach's efforts can be best explained as biodiversity protection, which was not limited to the usefulness living beings. As the story goes, Noah also mobilized species which were considered by humans as useless or even dangerous for human health, agricultural and other activities. This is proves that many thousands of years ago, the natural environment and biodiversity were viewed by many as a unique system in which every element is vitally important. The story about the Noah's Ark is represented in most of holy books. It came to the Koran from the Bible, to the Bible from the Old Testaments. The most aged Noach's stories source is the inscriptions on the stone which has been made more than 5,000 years ago and discovered on the territory of modern Iraq. This inscription now is the exhibit of the British Museum, London (1). The medieval manuscripts are the other source of the historically proven ways for natural resources management. Many of these manuscripts content the information

about integrated and wasteless mobilization of the different species of medical plants and animals (2). This knowledge, especially combined with most recent scientific achievements is also very valuable for resources sustainable management in biosphere reserves.

Learning tools on SD published in Azerbaijan involved the information that societal concern about the quality of natural environment had grown into special laws and regulations. According to the learning tools most probably that new legislative document - SDIA (Sustainable Development Impact Assessment) will be introduced. Now this issue is subject of discussions of the international development institutions. The Azerbaijan National MaB Committee's Proceedings and national learning tools contain information which will be supportive for transition to SDIA development practice (3).

The term of "ecocivil" as characterization of civilization based on environmental principles has been coined in the Azerbaijan National Human Development Report, 1996 as one of development options providing for exclusion of the possibility of "development without future" (look 4). The presently used technologies both in the industry, agriculture and domestic activity are based on an excessive consumption of non-renewable natural resources and environmental degradation. The state of natural resources consumption and environmental degradation has reached a point where it threatens not only the present but also the future generations. These conditions stipulate a necessity to apply a concept that would integrate the available historical experience with the latest achievement of the scientific and technological progress. Eco-civilization, then, requires the ecologization of human economically activities and ecologization of human mode of life, including control for demographic situation, consumption culture, decreasing the risk factors and increasing the anti-risk factors (anticarcinogens, geroprotectors, antimutagens (5). Ecocivil principles of environmental quality planning and management require ensuring ecological security and implementation of the sustainable development principles on the basis of a complex system in which engineering and technological solutions are combined with mitigation measures. Mitigation measures involve also compensational approaches with mobilization of the antimutagens, anticarcinogens and geroprotectors to provide people's health and longevity, as well as conservation biodiversity (6).

References

1. Alakbarov U., Golden K., Hashimova U., Love A., Newsome A. Environmental management for sustainable human development. WU Azerbaijan – MVSU U.S.A., 2005, 105 p.

2. Alakbarly F. Medical manuscripts of Azerbaijan. Baku, Heydar Aliyev Foundation, 2006, 264 p.

3. Proceedings of the Azerbaijan National MaB Committee. Baku, Elm, 2007, v.4, 193 p.

4. Alakbarov U. Fundamentals of sustainable human development. Baku, Tehsil, 2007, 131 p. (on Azerbaijani language).

5. Class R., Alakbarov U., Ames B., Kada T., Wattenberg L. Inhibitors of mutagenesis and their relevance to carcinogenesis. J. "Mutation Res.", 1986, v.168, p. 141 – 168.

6. Alakbarov U. Plant antimutagens and their mixtures in inhibition of genotoxic effects of xenobiotics and ageing processes. European J. of Cancer Prevention, v.11, 8, p. 8–11.

How can protected areas offer local people a chance to participate and benefit?
Protected Area Management and participation as key factors for the acceptance and the sustainable implementation of the "protected area idea" – the case study of the Biosphere Reserve Grosses Walsertal

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1. Introduction

More than 113 700 protected areas cover 19.6 millions square kilometres of the planet's surface – today over 12 percent of our planet is under protection (Lockwood et al. 2006). Protected areas – whatever category they are - offer a high potential to involve the local population, to make them conscious of protection issues, to make them feel responsible for their area and invite them to participate. In addition the matter of sustainability plays an always more important role in protected areas. Sustainability includes the theme of participation, which has become a key phrase for successful protected area management and one of the strategies for good governance of protected areas. A new focus of protected areas concepts is to see them as regional management instruments (Hammer 2002, Jekel 1998, Kals 1997). Especially the concept of Biosphere reserves focuses on the issue of sustainable regional development and emphasis the importance of participation.

Discussions and questions about the successful implementation of protected areas are becoming increasingly important. Particularly the interdisciplinary discussion between pure nature conservation and the interaction of man-nature in protected areas as well as questions of sustainable development (Lockwood M. et al. 2006) gain importance. In the sense of an „applied-geographical"perspective the analysis of implementation problems and the creation of protected areas in the local-regional context are important research topics. Another focus of scientific research is the local populations' perception and acceptance of the idea of protected areas.

2. Background

Based on my many years experience as a protected area manager in the UNESCO biosphere reserve Grosses Walsertal (A) I started to scientifically investigate the theme of participation in protected area management as well as the successful

implementation of the protection idea by looking at various case studies in Austria and abroad and by comparing the experiences made in the BR Grosses Walsertal with the outcomes and management processes in other protected areas. The focus of the presented case study at the EuroMAB Meeting is the Biosphere Reserve Grosses Walsertal.

The main objective of my dissertation is to find out how protected areas can offer local people a chance to participate and benefit. Another research topic is how the managements of protected areas deal with the role of participation. One part of my work is to make a scientific comparison between the case studies to show similarities and to discuss how different protected areas can learn from each other along the principle of good practice. I want to find out if there can be a possible method transfer to optimize the respective protected area management.

3. Case Study Biosphere Reserve Grosses Walsertal

The Grosses Walsertal in Vorarlberg (A) – a UNESCO Biosphere Reserve since 2000 - serves as pilot scheme for further steps of the dissertation and future field work abroad. The Grosses Walsertal Biosphere Reserve, situated in the Western part of Austria and formed by six villages within a single alpine valley was designated as a UNESCO biosphere reserve in November 2000. The valley is a prime example of a living cultural landscape where a system of adapted mountain farming, pasture and extensive forestry has been developed. Today the mosaic of open land, forests and traditional settlements is the origin of a high animal and plant diversity. Turning the Grosses Walsertal into a biosphere reserve, so the hope was, would give regional development a positive impetus and boost a sustainable tourism while retaining the local cultural identity. About 60 committed locals worked together to develop a vision for the future development of their valley. In the course of planning the biosphere reserve the pessimistic assessment of the valley and its small development potential gave in fact way to a general mood of optimism. The motto was: “We want to make life more enjoyable and work more profitable. The label biosphere reserve can help us to achieve this aim.” The local communities used the MAB concept and the biosphere reserve as a mean to empower themselves to work together in meeting the challenges of the future – challenges which are shared with many other biosphere reserves all over the world.

These experiences and lessons learnt are the basis of my field work in the BR Grosses Walsertal. In addition to different socio-scientific research methods such as expert interviews, surveys, analysis of existing data I use the method of the “future workshop” – a participatory approach to involving local stakeholders, asking them how protected areas become a chance for them to benefit. The first results of my field work as well as the experiences of the last years when the BR was implemented with broad participation can probably answer – to a certain

extent - some of the key questions of this thematic issue: for example how the BR is addressing the full scope of sustainable development, how sustainability is defined, what specific actions are undertaken for sustainable development, how the BR is used for education activities, the linkages between science, policy and practice to, examples for measuring the effect and effectiveness of sustainable development in the BR Grosses Walsertal as well as the issue of participation being the basis for reaching sustainable development.

4. Implementation of the MAB concept – how is the BR Grosses Walsertal made visible for the local population, how is the place used as a learning site for sustainability?

In the Grosses Walsertal the local population was involved in the planning process right from the beginning. Some examples for the participatory approach are: Participation from the beginning, Information for the local population, Common concept made by the local population in 1999, a painting competition for the BR logo in schools, the regional newspaper „Point of view", the involvement of the local people in various project groups, the BR management as a coordination center, visible, small scale projects – communication of the projects as a key-factor.

Approaches and methodology for making the label Biosphere Reserve successful

- Participation and bottom up
- Personalise the BR, not only an institution
- Associate campaigns and projects
- Explaining the concept in the right words
- Mobilize the know how of the valleys' inhabitants
- Several methods for activating the local population
- Exchange of experiences with other regions and BR's
- having the label BR as „joint brand" – crossing borders
- Give the development and the projects time….

5. How is the BR addressing the full scope of sustainable development, how is sustainability defined, what specific actions are undertaken for sustainable development?

- Good „balance" of the projects to meet the 3 functions of a biosphere reserve, Planning session with representatives and stakeholders every year
- Examples of projects in tourism, agriculture and nature protection, local products, labels etc.
- Sustainability report with core indicators
- Sustainability includes the involvement of the locals – pilot study future workshop with visions for the next decade, expert interviews

6. Results of the interviews: How can participation be successful?

- Not always the same people should be involved
- Involvement for a if wished limited period
- Thank you - culture
- The feeling that you can work and decide, not only work and the decisions are made by the politicians
- Coordination center where people find help
- Capacity building and know how
- Certain autonomy

7. How is the BR used for education activities?

- Image campaign for the different zones of the BR (Interviews and Information)
- Adventure Biosphere Reserve – activities for schools
- Involving the locals in the Research Concept – „translation" of the results
- EduMAT – materials about the BR for school, new methods and interactive approach
- Activities like open day in the management, hiking day with experts into the core area

8. Examples for measuring the effect and effectiveness of sustainable development in the BR Grosses Walsertal

- Research project REPA (cofinanced by MAB Austria, Academy of Science) – perception, acceptance and the first economic results
- Unternehmen V – to measure how sustainable (future) projects are
- Sustainability report with core indicators and EMAS certification for the BR
- Dissertation project with the future workshop

REPA project

- Proved that the label BR is a stimulus for sustainable regional development
- Inside perspective: 84% of more than 500 interviewed persons: see BR as very useful or useful
- 68% Recognition as a BR brought a positive change (increase of added value, postive effect on tourism)
- 69%: BR brought advantages
- 40%: interested in participating in future projects

Possible transfer

- Future workshops
- What are the measures for success, where are the obstacles?
- Participation approaches
- Working with a small budget and volunteers
- Methods for measuring sustainability (indicators) – sustainable management system
- Education material
- Project exchange – learning from each other and not making the same mistakes

9. References

Borrini-Feyerabend, G. (2004): Governance of protected areas, participation and equity; In: Biodiversity Issues for Consideration in the Planning, Establishment and Management of Protected Areas Sites and Networks, Convention on Biological Diversity Technical Series 15, Secretariat of the Convention on Biological Biodiversity, Montreal.

Borrini-Feyerabend, G., Pimbert, M., Farvar, M.T., Kothari, A. und Renard, Y (2004): Sharing Power: Learning by Doing in Co-Management of Natural Resources throughout the World, IIED and IUCN/CEESP, Teheran.

- online www.iucn.org/themes/ceesp/Publications/sharingpower.htm#download (1.5.2007)

Büchter, C., Leiner, C. (2000): Schutzkategorien im Naturschutzrecht. Systematische und kritische Übersicht, Kassel.

Deutsches MAB-Nationalkomitee beim Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit (Hg.) (2003): Voller Leben. UNESCO-Biosphärenreservate - Modellregionen für eine Nachhaltige Entwicklung, Berlin, Heidelberg.

Erdmann K.-H., Frommberger, J. (1999): Neue Naturschutzkonzepte für Mensch und Umwelt, Berlin.

Erdmann, K.-H., Brendle, U., Meier, A. (2004): Kommunikation und Kooperationen. - In: Deutsches MAB-Nationalkomitee (Hrsg.): Voller Leben. UNESCO-Biosphärenreservate-Modellregionen für eine Nachhaltige Entwicklung. Berlin, Heidelberg u.a., S.59-65.

Erdmann, K.-H. (1999): Naturschutz - quo vadis? Anregungen zu einer Neuausrichtung. In: Petermanns Geographische Mitteilungen 143, Pilotband 2000, S.80-85.

Gebhardt, H., Glaser, R., Radtke, U., Reuber, P. (2007): Geographie – Physische Geographie und Humangeographie, München.

Hammer, T. (2002): Das Biosphärenreservat-Konzept als Instrument nachhaltiger Regionalentwicklung? – Beispiel Entlebuch, Schweiz. In: Mose, I. und Weixlbaumer, N. (Hg.) (2002): Naturschutz: Großschutzgebiete und Regionalentwicklung.

Hammer, T. (2003): Großschutzgebiete – Instrumente nachhaltiger Entwicklung. München.

Hockings, M., Stolton, S., Dudley, N. (2000): Evaluating Effectiveness – A Framework for Assessing the Management of Protected Areas. IUCN, Gland und Cambridge.

IUCN (Hg.) (2001): Biosphere Reserves, In: Parks, Vol. 11, N.1, Newbury.

IUCN (Hg.) (1994): Richtlinien für Management-Kategorien von Schutzgebieten. Nationalparkkommission mit Unterstützung des WCMC, IUCN, Gland und Cambridge, FÖNAD, Grafenau.

IUCN (Hg.): Workshop Stream III: Governance of Protected Areas – New Ways of Working together.
Online:
www.iucn.org/themes/ceesp/Wkg_grp/TILCEPA/WPC/governance%20final%20report%20Oct%2003.pdf (2.5.2007)

Jekel, T. (1998): Regionalmanagement und Regionalmarketing. Theoretische Grundlagen kommunikativer Regionalplanung. SIR 18, Salzburger Institut für Raumordnung und Wohnen, Salzburg.

Jungmeier, M., Kohler Y., Ossola C., Plassmann G., C. Schmidt, Zimmer P. , Zollner D. (2006): Protected Areas - Can large protected areas be instruments of sustainable development and at the same time suitable

instruments for protecting natural diversity?, Report of Project Question 3 – Projekt “Zukunft Alpen” der CIPRA International, Schaan.
Online:
www.cipra.org/alpknowhow/060424eReportQ3Final/download (1.5.2007)

Kals, R. (1997): Schutzgebietsmanagement als integrierter Bestandteil der Regionalentwicklung. In: ARO, Alpine Raumordnung 14, S. 80-84.

Lange, S. (2005): Leben in Vielfalt – UNESCO Biosphärenreservate als Modellregionen für ein Miteinander von Mensch und Natur, Österreichische Akademie der Wissenschaften, Wien

Lockwood M., Worboys G.L., Kothari A. (Hg.) (2006): Managing Protected Areas – A global Guide, Earthscan, London.

Mose, I., Weixlbaumer N. (2006): Protected Areas as a Tool for Regional Development? In: Siegrist, D., Clivaz, C., Hunziker, M. & Iten, S.: Exploring the Nature of Management. Proceedings of the Third International Conference on Monitoring and Management of Visitor Flows in Recreational and Protected Areas. University of Applied Sciences Rapperswil, Switzerland,13-17 September 2006. Rapperswil, S. 149-154.

Mose, I., Weixlbaumer N. (Hg.) (2002): Naturschutz – Großschutzgebiete und Regionalentwicklung. Aachener Schriften – Schriftenreihe Naturschutz und Freitzeitgesellschaft, Band 5, St. Augustin.

Oleire-Oltmanns, W. (2000): Parks für das Leben. Eine Versöhnung von Naturschutzgedanken und Wirtschaftsinteressen ist möglich – darin liegt die Zukunft der alpinen Gebiete. In: Weltwoche 50, S. 29.

Österreichische UNESCO Kommission (Hg). (2006): Proceedings Euromab Austria 2005 – Meeting of the Euromab Biosphere Coordinators and Managers, Wien.

Reutz-Hornsteiner, B. (2002): Entwicklung von unten – der Weg des Biosphärenparks Großes Walsertal, Österreich. In: Mose, I., Weixlbaumer, N: Aachener Schriften – Schriftenreihe Naturschutz und Freitzeitgesellschaft, Band 5, Naturschutz – Großschutzgebiete und Regionalentwicklung, St. Augustin, S. 40 bis 55.

Reutz-Hornsteiner, B. (2001): Der UNESCO Biosphärenpark Großes Walsertal – natürlich menschlich – vom Leitbild zur konkreten Umsetzung, Tagungsband CIPRA - Österreich Jahresfachtagung 2001 „Wer hat Angst vor Schutzgebieten?“, Wien, S. 111 bis 120

Reutz-Hornsteiner, B. (2003): The Grosses Walsertal Biosphere Reserve in Austria: „Taking the future in our hands“. In: Biosphere Reserves Bulletin of the World Network, Nr. 12, UNESCO (Hg.), Paris, S. 32 f.

Simmen, H., Walter, F. (2007): Landschaft gemeinsam gestalten – Möglichkeiten und Grenzen der Partizipation. Thematische Synthese zum Forschungsschwerpunkt III „Zielfindung und Gestaltung“. Schweizerischer Nationalfonds SNF zur Förderung der wissenschaftlichen Forschung, Zürich.

Stoll, S. (1999): Akzeptanzprobleme bei der Ausweisung von Großschutzgebieten. Ursachenanalyse und Ansätze zu Lösungen, Frankfurt a.M.

Wallner, A. (2002): Biosphärenreservate – Chance für eine Region oder Einschränkung für die lokale Bevölkerung? Ergebnisse einer sozialwissenschaftlichen Untersuchung in der Schweiz und in der Ukraine. In: Informationsblatt Forschungsbereich Landschaft, Eidgenössische Forschungsanstalt WSL, Birmensdorf, Nr. 54, S. 3-6.

The Divergence between Orientation and Reality in BR Management – Lessons Learnt from Empirical Studies

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1. Introduction

The World Network of Biosphere Reserves (WNBR) has broadened significantly in spatial extent since the adoption of the Seville Strategy in 1995. The Strategy highlights the importance of sustainable development within the biosphere reserve concept. However, gaps in the consideration of socio-economic issues in biosphere reserve management become increasingly obvious. We are addressing the issue in asking how biosphere reserves as learning sites contribute to sustainable development.

We will explore this question on the basis of empirical data from the Governance of Biodiversity (GoBi) Research Project, which evaluates the success or failure for implementing protected areas and biosphere reserves. Its main hypothesis is that the ecological outcome of implementing protected areas and biosphere reserves depends on the appropriateness of the selected governance and management systems with regard to the local context, and on broader economic and political issues (Stoll-Kleemann 2005a).

2. Methodology and Data

This paper is based on empirical data from a global survey on biosphere reserve management in the second half 2006 that used two different instruments: while a short online questionnaire called "Factor Evaluation Sheet 2" (FES 2) assesses the interviewees' general perspective on nature conservation and protected area management presenting a condensed set of 27 factors to biosphere reserve managers for evaluation, telephone interviews with participants explicitly referred to the situation of the management of the individual biosphere reserve. This two-fold global survey on biosphere reserve management was performed with 213 local experts, mainly leading managers of biosphere reserves. Amongst others, they were asked to rank the importance of participation for the successful implementation of the biosphere reserve concept (Stoll-Kleemann & Welp 2008). The survey covered 78 out of 101 countries with an overall response rate of 42%. About one third of the accomplished interviews are from Europe (72 biosphere

reserves). Additional in-depth case studies from the Eastern Europe (conducted by Schliep: see Schliep et al. 2007) Czech Republic (Šumava BR), Hungary (Aggtelek BR) and Poland (Babia Góra BR) and from Northern Europe (conducted by Welp: see Welp 2000) in Estonia (West Estonian Archipelago BR), Finland (Archipelago Sea BR) and Germany (Rügen BR), complement the general picture and assessed two questions: the suitability of national institutional and management frameworks for BR management as well as the relevance of participation and intersectoral cooperation.

3. Results from GoBi's Global Survey on Biosphere Reserve Management

Governance types and management constraints

The prevailing governance type among the biosphere reserves assessed is government management, followed by multi-stakeholder management, while other governance types such as private or community management play only a minor role (see Figure-1).

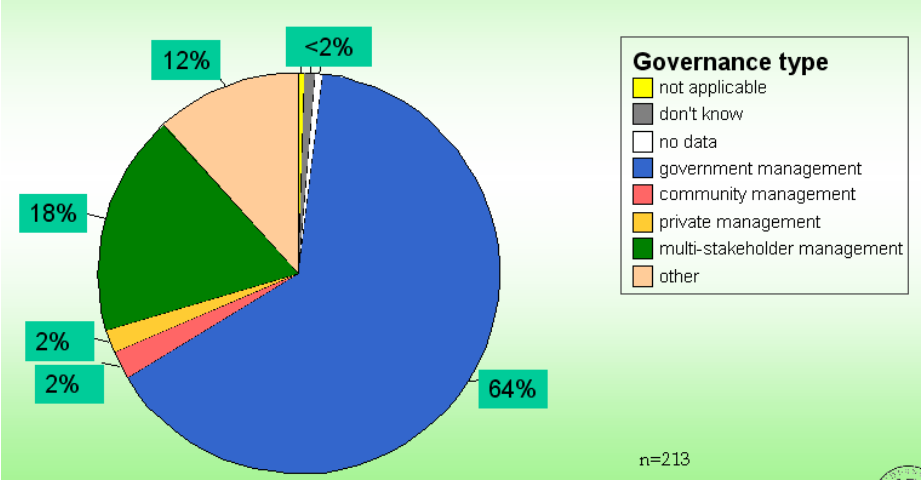

Figure- 1. Governance types for biosphere reserves

When considering the important role of societal wealth, one can observe similar but slightly differing trends in governance constraints: in high income countries as well as in non-high income countries, the lack of resources plays a central role. However, while this aspect is of utmost relevance for the success of biosphere reserve management in the non-high income countries, problems arising out of insufficient, unclear or conflicting rules, laws and programmes are of even higher relevance for biosphere reserve managers in high income countries. Further obstacles in the field of governance are lack of support and commitment, unclear or conflicting responsibilities and competencies, and last but not least the lack of implementation of rules and laws.

The institutional and management framework with its supporting and challenging characteristics is supposed to be echoed on the level of long-term management strategies. From the point of view of our interview partners, two of the major impacts from these management constraints are reduced conservation success and low biosphere reserve management performance in both, high and non-high income countries. It might be a special characteristic of the biosphere reserve concept, that social and ecological aspects play a predominant role in the long-term objectives of biosphere reserve management with social aspects having a slightly higher appreciation than ecological aspects among biosphere reserve managers (Stoll-Kleemann 2005b).

The role of participation

Results show that environmental education could attract the highest score among the success factors for biosphere reserve management (see Table 1), emphasising a people-oriented approach, while the factors dealing with participation are on rank 2 ("collaboration with local authorities") and rank 6 ("community participation"). In general, the necessity to work closely and in an atmosphere of mutual trust with the local population was recognised as central for implementing conservation and sustainable development in biosphere reserves (Stoll-Kleemann & Welp 2008).

Table- 1. Top 15 factors influencing biosphere reserve success
(*Source: Stoll- Kleemann & Welp 2008*)

Fifteen most important influence factors (out of 27) for the success of biosphere reserve management (n=204); Data gathered end of 2006, arithmetic scale from 1 (lowest score) to 10 (highest score)	
Influence Factor	**Arithmetic Means**
Environmental Education	8,5
Cooperation with local authorities	**8,2**
Long-term research activities	8,0
Monitoring and evaluation for adaptive management	8,0
Supportive national conservation policies	7,9
Community participation	**7,8**
Leadership	7,8
Long-term funding	7,8
Political support at regional level	7,7
Well trained staff and sufficient in number	7,7
Practical conservation measures	7,5
Access, equipment, communication	7,4
Consideration of traditional knowledge	7,3
Clearly defined responsibilities among governmental bodies	7,2
Clear boundary demarcation	7,1

A different picture can be drawn from the assessed case studies: with regards to participation and intersectoral cooperation, in none of the case studies management was dominated by an approach where activities of different sectors are coordinated and participation is regarded as central element already in the beginning of planning processes (Welp 2000, Schliep et al. 2007, Stoll-Kleemann & Welp 2008).

Quite the contrary, participation is often understood as a formal process of bare, downward vertical information transfer, if there is any involvement of stakeholders at all. In addition and while institutional and management frameworks are highly determined by national conditions, there is only a weak linkage between the biosphere reserves and the local / sub regional governance context (interest groups, communal authorities, regional concepts, strategies, and planning). Furthermore, the linkage between the case study sites' biosphere reserves and the WNBR (national, European and international level) leaves room for improvement: the impacts of the National MAB Committees seem to be very limited in this respect.

4. Conclusions and Recommendations

We conclude that the gaps between the intended orientation of biosphere reserve management on the one hand and its reality on the other hand point towards the need for a re-orientation of biosphere reserve management and for an improved role of the WNBR in supporting the individual biosphere reserve in that. In the regional development context, biosphere reserves should not function primarily as a planning unit but rather as learning sites for the promotion of cooperation among authorities and other actors. biosphere reserves could thus become an initiator and a mediator of efforts towards improved participation and cooperation. Biosphere reserve advisory boards could steer and coordinate programmes towards improved participation and cooperation and provide a forum for making policy recommendations for sustainable development on the regional level. National MAB Committees should be put in the position to support biosphere reserves with expertise concerning fund raising, regional development strategies and programmes, participatory management, and communication strategies. To address these challenges, biosphere reserves as well as National MAB Committees require a far better instrumentation in terms of both, staff and budget – which are two of the main constraints many have to face.

For further information on the GoBi Research Project:http://www.biodiversitygovernance.de/

5. References

Schliep, R., Dabrowski, P., Kovacz, D., Urban, F. and M. Meyer 2007: Background Study on Institutional and Management Frameworks in the Biosphere Reserves Aggtelek (Hungary), Sumava (Czech Republic) and Babia Gora (Poland). Study on behalf of UNESCO-MaB/GEF, Ecological Tourism in Europe (ETE), Paris/Bonn

Stoll-Kleemann, S. (2005a). Voices for Biodiversity Management in the 21st Century. Environment 47 (10), 24-36.

Stoll-Kleemann, S. (2005b). Indicators and evaluation of sustainable natural resource management and governance in biosphere reserves. Global Change Impacts in Mountain Biosphere Reserves, Paris: UNESCO, 2005, 237-245.

Stoll-Kleemann, S., Welp, M. (2008). Participatory and Integrated Management of Biosphere Reserves – Lessons Learnt from Case Studies and a Global Survey. GAIA – Ecological Perspectives in Science and Society, Special Issue on Biodiversity, Sustainability and Protected Areas.

Welp, M. 2000. *Planning Practice on three Island Biosphere Reserves in Estonia, Finland and Germany: a comparative study*. Paris: INSULA (International Scientific Council for Island Development) c/o UNESCO-MAB.

Experience of the Lower Morava Biosphere Reserve in being a learning site for sustainable development

Petr CUPA

Lower Morava Biosphere Reserve

Czech Republic

Lower Morava Biosphere Reserve, the youngest Czech biosphere reserve, was approved in 2003. The area, covering little over 350 km^2, is situated in the south-east corner of the Czech Republic. The reserve houses a unique combination of limestone cliffs, the rare Central European lowland floodplains covered by hard-wood floodplain forests and continental alluvial meadows and the largest European man-made landscape - the Lednice-Valtice Cultural Landscape – listed as a UNESCO World Heritage Site. Amongst various types of habitats you can find karst, dry grasslands, fishponds, marshlands, vineyards and other, mostly intensively farmed agricultural land.

As from August 2004, the **Lower Morava Biosphere Reserve, Public Benefit Corporation,** became the administrative authority of the BR**.** In the Czech Republic it is for the very first time that a biosphere reserve is administered by a non-governmental organization. This concept of an independent management is unique, as the rest of the Czech biosphere reserves are linked to official government protected areas and share the management. In case of Lower Morava the founders of the Public Benefit Corporation came from a wide spectrum of society. Among founders are representatives of local businesses, agriculture and industry, together with the Ministry of the Environment and the largest nature conservation non-governmental organization in the Czech Republic, which creates a diverse and sometimes turbulent environment for sharing ideas related to the reserve and its projects.

I would like to share the experience of the Lower Morava Biosphere Reserve in trying to be a learning site for sustainable development. In order to serve as a model area for "the outside" of the BR, we need to achieve inner balance first by promoting widely understood sustainable development projects. In our relatively short history we have learned that being a successful learning site for sustainable development, we need to fulfill the following tasks: to elicit good ideas, to communicate, to create strategy-oriented projects with proper follow-up and to market good examples effectively.

The first step is to propose good project ideas. We explore various idea sources in our BR. We frequently use the MAB network to look for inspiration. The great advantage of sharing the experience and expertise through the network enables us

to avoid possible mistakes. Other sources of ideas for us are local communities. In many cases the locals approach our BR with a problem, looking for solutions. It is our duty of as a moral manager of the area to help them and it is our responsibility to the future generations to help them through a project based on the principles of sustainable development. We developed rather successful procedure for sharing project ideas. The managing body of our BR is the executive board, where key stakeholders, nature conservation authorities and all local communities are represented. This creates a wide and diverse brainstorming platform. This environment also provides the project draft proposer with first-hand feedback on the feasibility of the idea. If all involved parties adopt the concept at this very early stage as their own and if they perceive the idea as beneficial to the area, the future projects will be less demanding to perform.

In my opinion the second key element for successful support of sustainable development is successful communication. I believe it is probably the most important one. Ironically, the most difficult obstacle we have had to face in the process of promotion of sustainable development projects within our BR is the "controversial" reputation of governmental and many non-governmental nature conservation agencies. This is because a significant part of the, especially rural, communities perceive them as "troublemakers" pressing upon restrictions to pursue their own narrow agenda without wider discussion. Many projects are doomed before they even take off because the parties involved do not communicate sufficiently. Since the concept of BR represents, and must combine, much wider fields of interests – nature protection, natural and cultural development, education, research etc. – BR management should step up to the plate and pick up the challenge of an independent mediator. The key point for successful implementation of all projects is wide approval of all the parties involved, and the understanding that local communities play a crucial part in the process. In project preparation, our BR tries to launch an information campaign among municipalities, explaining that the project is about sustainable development and not another form of restriction that usually conservation agencies enforce upon them. In our conditions, overcoming prejudice and suspicion on both sides is sometimes a tiring but necessary chore of every project manager.

Another way, in which the Lower Morava Biosphere Reserve acts as a learning site of sustainable development, is the initiation of projects that create development strategies and form easy accessible project sources for consequential follow up. I would like to give examples of such projects. Owing to its close vicinity to the state border with Austria, the access to a spectacular part of our BR, called Soutok (Confluence of Morava and Dyje rivers) was severely restricted until 1989. Limited public access enabled the preservation of a diverse floodplain forest. Following the fall of the Iron Curtain, the area has become accessible to

visitors whose numbers are increasing. In recent years the area has enjoyed growing tourist interest with all the positive and negative impacts involved. Consequently, two years ago, our BR, in co-operation with the South Moravian Regional Development Agency, created a project whose main objective was to prevent possible degradation of the area without any major limitations to the access. The project called "Development of Sustainable Tourism in the Area of Soutok", using moderated discussion with key subjects in the area, came into life as a result of an agreement between representatives of the general public, business, nature conservation authorities and non-profit spheres. One of the outcomes was the inception of nine pilot projects e.g. Visitor Trails, Visitor Center, Visitor Programs at Soutok etc.Through this project we succeeded in steering the area's future towards sustainable development. Two of the projects are already underway and the rest are waiting to be implemented once the financing has been resolved. An unquestionably positive outcome was the fact that each group was interested in finding a collective solution. All the parties concerned appreciated both the project and the ensuing partnership, and agreed to implement several of the proposed pilot projects designed to enhance the region's development in the future. Our BR will safeguard the joint venture so as to jeopardize neither the environment nor the interests of individual stakeholders.

Another project involving strategy planning is the Management Plan of the Lednice-Valtice Cultural Landscape, World Heritage Site (hereupon LVCL). The entire area of the WHS constitutes a significant part of our biosphere reserve. As with every World Heritage Site, the area must adhere to rules and regulations which are set by international agreements. Among them is the obligation to establish a management plan as a set of rules whose objective is to preserve, improve and promote the sustainable development of the WHS in question. The South Moravian Regional Authority thus put its establishment out to tender and our BR succeeded in it with own version of the Management Plan (MP). We established the plan on the basis of relevant foreign materials, and thorough study of the expert materials, consultations and discussions with concerned entities from within the area. The contents of the MP focus primarily on the establishment of a framework of action and its co-ordination within the area. Its main objective is to preserve the values and to create the necessary conditions for a sustainable development of the area in question. One of the partial objectives is to define the position and activities framework of a site manager. As authors of the management plan we are aiming to win this position.

Last but not least, proper PR aimed at the general public is vital. Once a project is launched we need to share our experience through media in such a form that even an uninitiated person can understand. This is a field where our BR has weaknesses. Unfortunately, today's media are not very interested in presenting projects that are beneficial to the people and the nature and there is no casualty along the way… It

is a long distance run to educate the media on topics, such as sustainable development. One may disagree, saying that a good project speaks for itself. It is true. Yet, we would welcome an informal forum within the MAB network which would enable us to share practical tips and any ideas how to approach the public through media on the topic of sustainable development. In our experience the only way to succeed is to fortify ourselves with patience and to consistently promote ideas of sustainable development in every interview we give.

The Lower Morava Biosphere Reserve has learned that becoming a promotional platform for Sustainable Development means:

- to explore various idea sources, look to the MAB network and the local communities and stakeholders for inspiration and come forward with feasible projects
- to create project partnerships and incorporate various stakeholders into BR management structures to create favourable brainstorming conditions and to allow first hand feedback
- to communicate since many of the projects are doomed before they even start because the concerned parties do not communicate sufficiently. BR management should serve as an independent mediator and communication leader.
- to initiate the development strategies, to create easy accessible source of sustainable development projects and to market good examples in media

We do our best to follow all the above points to improve the process and become a better learning platform for sustainable development.

Case Study: Collaboration and Integration Experiences from Canada

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Summary
In several biosphere reserves in Canada, we have seen innovative approaches to collaboration, networks and sustainability planning. At the same time, the themes of conservation and sustainable development have become much more integrated within some biosphere reserves. Older biosphere reserves that originally focused on conservation efforts have evolved over the years to consider a wider range of sustainability considerations at broader scales, such as: sustainable livelihoods (agriculture, forestry), community economic development (tourism, education, youth employment), and how to building capacity for managing the biosphere reserve. The Long Point world biosphere reserve in the Canadian province of Ontario, on the Great Lakes, will be used as a case study to illustrate these themes.

1. Long Point Biosphere Reserve

The Long Point World Biosphere Reserve was designated by UNESCO in 1986. It is internationally recognized as a unique geomorphic and ecological system on one of the Great Lakes, is historically protected as a sports fishery and wild game reserve, and is surrounded by agricultural lands. The Point itself is a 40 km sand spit created by erosion deposit on the north shore of Lake Erie (Figure 1). As the southernmost region of Canada, it contains the only remaining Carolinian deciduous forests in the country. It provides a major migratory bird corridor, provincial park, and a RAMSAR wetland complex.

Conservation of biodiversity was a major impetus for UNESCO designation in the 1980s. The Long Point World Biosphere Reserve Foundation (LPWBRF) –

volunteer committee [1] –was created to coordinate ecological monitoring and research, develop new conservation program s, and provide education. Fisheries and forestry restoration projects are ongoing and many have been highly successful, however, the LPWBRF felt that they were perceived as an "environmental group" without broader concerns for the changing economic base in the region.

Figure- 1. The Long Point sand spit and surrounding agricultural lands (*Google Earth, 2006*)

In 2001, the LPWBRF board decided to expand their activities from conservation to consider broader sustainability concerns, to help respond to the social and economic impacts of changes in agriculture, including the collapse of tobacco farming, the lack of employment opportunities for youth in rural villages, and the decline in tourism. The biosphere reserve developed a series of "Community Sustainability Workshops" to try and change local perceptions about the biosphere reserve, engage community members in defining and planning for sustainable development, generate new ideas and partnerships, and revitalize the LPWBRF organization.

In 2005, four different workshops were held with different stakeholders: (1) Business & Industry (2) Service Sector (3) Conservation (4) Agriculture. A total of 56 people participated in these workshops and helped identify the trends, issues, barriers, existing resources, and new ideas to advance integrated sustainable development. They provided a forum for discussion and to find common goals and plans. The workshops also raised awareness about the three integrated functions of UNESCO biosphere reserves and helped to change the perception of the Long Point biosphere reserve as just a conservation organization. New volunteers came forward to serve on the LPWBRF.

[1] Unlike many countries, Canada does not have a central government agency responsible for biosphere reserves. Instead, each biosphere reserve is a community-based initiative, dependent upon local collaborative arrangements to foster the three main functions of biosphere reserves, while drawing financial and support-in-kind from an array of government agencies, foundations and other partner organizations.

In 2006, the biosphere reserved organized a large community conference called "Building a Sustainable Norfolk County," with sessions on sustainable agriculture, ecotourism and agri-tourism, green businesses, reforestation programs, trails, and field trips. The conference was held during local government elections that generated added interest. Many politicians attended the event and committed themselves to sustainable development. The outcomes from this process are: the LPWBRF has a new identity and have made proposals for sustainable agriculture and sustainable tourism – both of which seem to have greater local and government support. Long Point biosphere reserve is considering an expansion to add new core areas of Carolinian Forest and expand their boundaries to interested rural communities.

It is interesting to note that the original mission of the biosphere reserve organization changed from: "The Long Point World Biosphere Reserve Foundation promotes research, monitoring, education and appropriate projects that support the goals of conservation and sustainable use in the Long Point World Biosphere Reserve" to: "Our vision is to become the facilitators of cooperative partnerships – based upon common goals and interests – that promote and foster a common approach for a more sustainable economic, social and environmentally sound community."

In conclusion, biosphere reserves can be learning platform for collaborative decision-making, community-based planning and integrated conservation and sustainable development. The Long Point case illustrates that biosphere reserves can be dynamic and responsive organizations, so they might evolve from a focus on core areas to larger scales and integration of social and economic sustainability concerns. As Dr. George Francis, adviser to Canada/MAB notes: "The main challenge for biosphere reserves is to address the full scope of sustainable development. It is generally recognized that sustainability is a matter of how best to maintain and enhance fundamental ecological and social processes for change and adaptation. The collective governance capacity needed to address these challenges effectively across a bewildering range of spatial and temporal scales remains largely underdeveloped." This is an area where biosphere reserves can rise to the challenge of becoming models of collaborative governance for integrated sustainability.

2. References

Environments Vol. 32 (3) Theme Issue: Biosphere Reserves in Canada: Exploring ideals and experiences. George Francis and Graham Whitelaw, Guest Editors. Available at: http://www.fes.uwaterloo.ca/research/environments/vol32-3.html

Biosphere Reserves as a key places for testing educational methodologies

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Introduction

This paper presents the framework of training activities addressed to young professionals with a university degree conducted as a part of the project "Environmental Education for Sustainable Development (EESD) - A regional training project scheme for the Adriatic-Ionian Basin", financed by the Italian Ministry for Foreign Affairs and implemented by UNESCO-ROSTE Venice Office.

The aim of the paper is to stress the methodological aspects and the approach to planning the activities, evidencing the importance of evaluation of the quality of the training. Innovative teaching methods were developed in planning the curriculum of the training. The aims were to address participants' environmental and ethical awareness, and to develop values and attitudes, skills and behaviour consistent with sustainable development. The activities were evaluated as an important step for verifying the effects and the processes induced. The results of the evaluation plan were used as a feedback to the implementation of the ongoing training initiatives of Education for Sustainable Development (ESD) within the project EESD.

1. The general plan of the training

The complexity of sustainable development principles requires the adoption of an interdisciplinary approach. Interdisciplinary approaches to teaching involve

professors to interpret and to analyse topics through the perspective of other disciplines.

Stark and Lattuca (1997) reported that interdisciplinary approaches had mainly been employed at advanced levels of higher education and recommended their application at undergraduate levels. For example, in some courses and programs the following four main principles were proposed: the reduction of early specialisation, the introduction of a common learning basis, the promotion of student motivation through addressing topics aligned to students' interests and the involvement of students in research and problem solving activities.

Fundamental knowledge should be identified, defined and developed along with best practice for stimulating connections between disciplines which should themselves have a holistic view of global problems. In order to achieve this, objective course organisation and curriculum planning will require quite fundamental change. Programs call for an interdisciplinary approach relevant to the different disciplines involved. Teaching methods should be based on learner-centred methodology and should include active methods (e.g. problem solving). An interdisciplinary approach to learning will require a change in organisation and a different approach to curriculum planning.

The following principles were considered in planning the activities of ESD:

- ESD relates not only to knowledge, but also to processes.
- ESD is a process, in which learners are taught how to think – not what to think.
- ESD intends to change the way of thinking
- ESD draws tools and resources from a wide range of disciplines in order to interpret problems and to suggest solutions. Environmental facts and events are analysed focusing on a greater number of approaches.
- To report different points of view considering the specific contribution of each discipline.
- To take note of the interrelationships between factors.
- Holistic and systemic view of the environment: complex analysis of the interrelationship of paradigms.
- To experiment, in accord with agenda 21, different methodologies and techniques.

2. Characteristics of the curriculum of the training

All the variables of the learning sequence were defined in planning the curriculum. Various steps were considered such as need assessment, the definition of aims and objectives (competences to be achieved), the selection of content, the choice of methodology, indicating methods and their related tools to be used during the activities, defining workload and the structuring of appropriate forms of evaluation.

Concerning the didactic methods, the learner centred approach was the reference, stimulating active learning and connections of new data with conceptual schemata in order to develop and implement them. The following approaches were adopted:

- Case Studies.
- Discovery learning.
- Problem solving.
- Brain storm.
- Cooperative learning.
- In field experiences.

The activities were organised focusing on the presentation of three case studies. The other lectures were connected with case studies, focusing on specific dimensions of them, providing information in an interactive way in the first part of them, opening the discussion in the second and lecturer conclusion in the last part.

The case-study method brings interesting, real-world situations into the classroom. The discussion of cases with fellow students develops the awareness that decision making is often a confrontational activity involving people with different points of view. It is important to work toward consensus while tolerating legitimate differences of opinions (Easton 1992).

Cases are typically proposed as environmental dilemmas that give a personal history of an individual, institution, or business faced with a problem that must be solved. Background information, charts, graphs, and tables may be integrated into the tale or appended. The teacher's goal is to help the students work through the facts and analyze of the problem and then consider possible solutions and consequences of the actions that might take.

Concerning the skills involved, the case method activates learning by doing, the development of analytical and decision-making skills, the internalization of learning, learning how to grapple with messy real-life problems, the development of skills in oral communications, and team work. A short definition could be "It's a rehearsal for life".

The case process is inductive rather than deductive. The focus is on students learning through their joint, cooperative effort, rather than on the teacher conveying his/her views to students.

The purpose of case teaching is to develop analytical and decision-making skills. Students develop in the classroom a whole set of speaking skills, debating and

resolving issues. They are also gaining a sense of confidence in themselves and relating to their peers.

The goal of case study method teaching is not so much to teach the content of the discipline (although that does clearly happen), but to teach how the process works and to develop higher-order skills of learning, focusing less on knowledge and more on comprehension, application, analysis, synthesis, and evaluation.

Concerning the discussion format, the instructor has a very important role: he has to conduct the student in analysing the various issues and problems, finding possible solutions, and consequences of action. On the surface of it, the method is simple: the instructor asks probing questions and the students analyze the problem depicted in the story with clarity and brilliance. Case discussion instructors could vary enormously in their classroom manner. On the one hand, you have the strong directive approach stimulating the discussion or you can have an almost nondirective class discussion.

At the end of the classes students will improve not only knowledge, but also skills. The following abilities were considered to be developed:

- Multi disciplinary way of thinking.
- Complex view of environmental issues.
- Thinking universally / acting locally.
- Awareness.
- Critical thinking.
- Decision making.
- Problem solving.

The final aim was to develop form of active learning in the students.

3. Evaluation of the quality of the training

The training activities were evaluated. The evaluation plan was focused primarily on the evaluation of the processes induced rather than on the evaluation of the products. It was planned to use student's evaluation of teaching effectiveness. Marsh and Bailey (1993) consider evaluation a multidimensional concept, characterized by many dimensions (Biasutti, 2006). Quantitative and qualitative approaches were used: the qualitative approach evidenced the meaning of a phenomenon, the quantitative approach the distribution of the effects of a particular phenomenon (Biasutti, 2007).

The instruments for student's evaluation of teaching effectiveness available in the literature were considered (Richardson, 2005, Wachtel, 1998), and it was decided

to construct special instruments considering the characteristics that needed to be measured.

The evaluation plan of the training used several quantitative and qualitative instruments for collecting data about the quality of the training offered. The evaluation involved participants, teachers and facilitators. Several elements were collected using students feedback questionnaires. The following scales were considered:

- the cognitive processes involved,
- the understanding of the concept of environment in his complexity,
- the skills involved in Education for Sustainable Development (ESD),
- the training offered,
- personal involvement in the training,
- the activities and the methodologies used.

The factors of the professors' scale were:

- classroom experience,
- the planning of the lecture,
- team work,
- the organization of the course,
- the activities,
- the methodologies used.

Data were elaborated using both quantitative (statistical analysis) and qualitative analysis. The results evidenced that the methodologies used produced an effective improvement in the quality of knowledge and attitudes toward the environment. The importance of proposing specific approaches based on a learner centred approach was evident. The interactive learning methodology, the cooperative learning activated during sub group work, and the case study methodology were important for developing factors such as *environment as complexity* and *skills and awareness in ESD.*

4. References

Angelo, T. A. (1993). A teacher's dozen: fourteen general, research-based principles for improving higher learning in our classrooms. *AAHE Bulletin,* 45 (8), 3-7.

Bennett, D B (1984). *Evaluating environmental education in schools: a practical guide for teachers*. Unesco-UNEP International Environmental Education Programme.

Biasutti M. (2006). *Analisi di un modello multidimensionale per la valutazione della didattica universitaria*, in, La valutazione della didattica universitaria. Milano: Franco Angeli (pp. 124-162).

Biasutti M. (2007). *Educating for sustainable development. Curriculum planning in higher education*. Sarajevo: Reich.

Biggs, J. (1996). Enhancing teaching thorough constructive alignment. *Higher Education*, 32, 347-367.

Biggs, J. (1999). *Teaching for quality learning at university.* Buckingham, UK: SRHE and Open University Press.

Borko H., Putnam R.T. (1996). *Learning to teach.* In Berlinger D.C.

Calfee R.C. (Eds.), *Handbook of Educational Psychology,* pp. 673-708. New York, Simon and Schuster MacMillan.

Burgoyne J., Mumford A. (2001), *Learning from the case method;* Beds (UK): The European Case Clearing House.

Cohen, E. (1994). Restructuring the classroom: Conditions for productive small groups. *Review of Educational Research*, 64, 1-35.

De Rebello, D. (2003). The Role for Higher Education institutions in the UN Decade of Education for Sustainable Development, *International Conference on Education for a Sustainable Future Shaping the Practical Role of Higher Education for a Sustainable Development*, Charles University, Karolinum, Prague, Czech Republic, 10 – 11 September, 2003.

Diamond, R. M. (1998). *Designing & assessing courses and curricula*. Jossey-Bass, San Francisco.

Easton, G. (1992). *Learning form case studies*. Englewood Cliff, New Jersey, Prentice Hall.

Engleson, D. C., Yockers D. H. (1994). *A guide to curriculum planning in environmental education*. Milwaukee: Wisconsin department of Public Instruction.

Geis G. L. (1996), Planning and developing effective courses, in R. J. Menges, M.Weimer & Associates, *Teaching on solid ground: using scholarship to improve practice,* Jossey-Bass, San rancisco, pp. 179-202.

Gibbs, G. (1992). *Teaching More Students: Problems and Course Design Strategies*. Oxford: Polytechnics and Colleges Funding Council.

Hativa, N. & Goodyear P. (2002). *Research on teacher thinking, beliefs, and knowledge in higher education: foundations, status and prospects*. In Hativa, N. & Goodyear P. (Eds). Teacher thinking in Higher education. Dordrecht (NL): Kluwer Academic Pubblisher, (pp. 335-359).

Johnson, D. W., & Johnson, R. (1999). *Learning together and alone: Cooperative, competitive, and individualistic learning.* Boston: Allyn & Bacon.

Marsh H. W., Bailey, M. (1993), Multidimensionality of students' evaluations of teaching effectiveness: A profile analysis, *Journal of Higher Education, 64:* 1-18.

Martin, E., Prosser M., Trigwell, K., Ramsden, P., Benjamin J. (2002). *What university teachers teach and how they teach*. In Hativa, N. & Goodyear P. (Eds). Teacher thinking in Higher education. Dordrecht (NL): Kluwer Academic Pubblisher, (pp. 103-126).

Menges, R. J., Austin A. E. (2001). Teaching in higher Education, in V. Richardson (Ed.)*Handbook of research on teaching*, American Educational Research Association, Washington, D.C., (pp. 1122-1156).

Ministry of Science, Technology and Innovation (2005). *A Framework for Qualifications of theEuropean Higher Education Area*. Copenhagen (Danemark): Ministry of Science, Technology and Innovation.

Mumford A. (2005). The case method- does learning theory matter?, *Development and learning in organization*, 19, 17-19.

Palmer J. A. (1998). *Environmental education in the 21st century. Theory, practice, progress and prmise.* London: Routledge.

Prosser, M. & Trigwell, K. (1999). *Understanding learning and teaching: The experience in higher education.* Buckingham, UK: SRHE and Open University Press.

Ramsden, P. (2003). *Learning to teach in higher education* (2nd ed.). London: Routledge Falmer.

Richardson J. T. E. (2005). Instruments for obtaining student feedback: a review of the literature,*Assessment & Evaluation in Higher Education;* 30: 387-415.

Scott W. and Gough S. (2003) *Sustainable development and learning*. London: Routledge Falmer, Taylor & Francis Group.

Scoullos, M., Malotidi (2004). *Handbook on methods used in environmental education and sustainable development*. Athens: Mediterranean Office for environment, culture and sustainable development.

Stark, J. S. (2002). *Planning introductory college courses*. In Hativa, N. & Goodyear P. (Eds). Teacher thinking in Higher education. Dordrecht (NL): Kluwer Academic Pubblisher, (pp. 127-150).

Stark J. S. and Lattuca L. L. (1997). *Shaping the college curriculum. Academic plans in action*. Boston (USA) Allyn and Bacon.

Stokking, K., van Aert, L., Meijberg,W., Kaskens, A., (1999). *Evaluating Environmental Education*. IUCN, Gland, Switzerland and Cambridge, UK.

Tigelaar D. E. H., Dolmans D. H. J. M., Wolfhagen I. H. A. P., van der Vleuten C. P. M. (2004). The development and validation of a framework for teaching competencies in higher education, *Higher Education*, 48 (2): 253-268.

UNESCO (1992). Agenda 21. Promoting Education, Public Awareness And Training (chapter 36). *Report of the United Nations Conference on environment and development*, Rio de Janeiro, 3-14 June 1992.

UNESCO (1998). *Higher Education in the Twenty-first Century. Vision and Action*, World Conference on Higher Education, UNESCO, Paris.

UNESCO (2003). *Synthesis Report on Trends and Developments in Higher Education since the World Conference en Higher Education (1998-2003)*, Meeting of Higher Education Partners, UNESCO, Paris.

UNESCO (2005a). *UNESCO action plan decade of education for sustainable development 2005–2014*, UNESCO, Paris.

UNESCO (2005b). *Report by the director-general on the United Nations decade of education for sustainable development: International Implementation Scheme and UNESCO's contribution to the implementation of the decade*, UNESCO, Paris.

Wachtel H. K. (1998). Student evaluation of college teaching effectiveness: a brief overview, *Assessment & Evaluation in Higher Education*; 23: 191-211.

Conclusions from Thematic Issue - I
How to use biosphere reserve as learning sites for sustainable development and what contributions to the UN Decade of Education for Sustainable Development?

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Moderator

Giorgio ADRIAN
UNESCO Secretariat

In thematic Session –I, which was decidated to be discussed Biosphere Reserves as learning platforms for sustainable development, have been determined the followings as the main findings related to role of Biosphere reserves in sustainable development.

1. Education for Sustainable Development
2. Participation - principles and methods
3. Participatory Approaches - models and tools
4. Monitoring
5. Communication
6. Research
7. Networks
8. EuroMAB Network
9. Observations and Questions
10. EuroMAB Action Plan

1. Education

- Sustainable development is a fundamental concept.
- We have a social responsibility to teach SD.
- Education for sustainable development is interdisciplinary for all levels of curriculum and public.
- It should reflect traditional knowledge (from indigenous people and farmers-fishers-etc.) for adaptating to change and building resilience.
- Multiple methods and various public-private partnerships for active learning are available.
- Note that UN**E**SCO resources can be used in BRs.

2. Participation – Principles & Methods

- Requires public education and awareness.
- Needs good leadership and communication.
- Should involve diverse stakeholders.

- Can build a common vision and shared values.
- Takes time and patience.
- Involves "learning by doing" to adapt.
- Evaluation and assessment is important.
- Knowledge and experience can be transferred.

3. Participation – Models & Tools

A. Grosses Wasertal (Austria) does annual project planning to balance the three functions – involves politicians to build awareness and get feedback on proposals.Tools for evaluating participation are available to share.

B. North Vidzeme (Latvia) has begun "citizen science" to have volunteers monitor species biodiversity using scientific protocols. This generates local data to "map" the natural and cultural values of an area. These international protocols are available to share.

4. Monitoring

- BRs can assess their current situation or produce a "State of the Environment" report.
- A "Sustainability Report Card" can be presented to local authorities and the public.
- Early detection of problems (red flags) will raise awareness and improve adaptive capacity
- Measure not only biodiversity indicators but also total ecosystem health and thresholds!
- Evaluate and share social-economic indicators.

5. Communication

- Show the benefits of biosphere reserves not just for conservation but for supporting livelihoods and improving quality of life.
- Share success stories through the media.
- Libraries can be partners for storing data and sharing biosphere reserve projects.
- Need to use diverse forums large/small and formal/informal to reach your audience.

6. Research

- Researchers have a responsibility to share results with Biosphere reserves participants and to "translate" technical information into plain language.
- A centralized database of all Biosphere reserves research publications would be helpful – or links to reports.
- Use existing tools (Wiki and Google Scholar)
- UNESCO could provide short summaries and then access to academic publications.

- Biosphere reserves can post their research priorities "wish list" on their website to match researchers with projects.
- Note that National MAB Committees could help to facilitate this logistics/research role.

7. Networks

- We are all part of multiple networks: locally-nationally-regionally-internationally.
- It takes time and dedication to participate.
- Networks can be vulnerable and collapse.
- Need to diversify funders-partners-projects.
- 20% of Biosphere reserves multi-stakeholder or community-led.
- 64% of Biosphere reserves are governmental organizations.
- Government policies to confirm BRs as "learning laboratories" would help them in this role.

8.1 EuroMAB Network – I

- How to make EuroMAB a functional network?
- How to link to other regional sub-networks?
- How to improve thematic networks?
- Do we need EuroMAB meetings every year?
- What should the format be? Open spaces?
- How can managers/coordinators set an agenda?
- We need to find our genuine role among all the other networks and players… what is the special mission and place of EuroMAB?

8.2 EuroMAB Network - II

The Online Platform has great potential:

- Needs to be more dynamic and interactive.
- Needs a part-time moderator to invite submissions – send us requests and reminders.
- Needs better structure and organization with a good internal search engine using key words.
- Promises to provide a "dating service" to match projects and partners.

8.3 EuroMAB Network - III

Possible objectives for the Online Platform:

1. To encourage communication and exchange with an accessible-useable-interactive tool.
2. To identify strengths of the EuroMAB members and network and then share our experience-competence-lessons with WNBR.
3. To compile and analyze Biospeher reserve best practices and lessons learned over time and to assess the effectiveness of network participation.

8.4 EuroMAB Network - IV

An online submission form would facilitate better participation & information for learning:

"Success Stories" – best practices and projects
"Lessons Learned" – challenges and failures
"Help Wanted" – ideas, resources and links
"Match-Making" – partnerships and proposals
"Working Groups" – themes and discussions

8.4.1 Possible Working Groups

1. Education for Sustainable Development: tools-methods-resources
2. Participation in Biosphere reserve: tools-models-assessments
3. NGO involvement: ideas-approaches-partners
4. Biosphere reserve governance: principles-process-evaluation
5. Building political support: strategies & ideas
6. Citizen Science: program set-up and protocols
7. Resilience in Biosphere Reserve: thresholds and adaptation
8. Eco-Tourism: criteria, programs and partners

8.5 EuroMAB Network - V

A new online magazine for EuroMAB/MAB could:

- Draw from the EuroMAB Platform submissions to share success stories and lessons learned.
- Announce grants-funding programs and new partnership opportunities for Biosphere reserves and countries.
- Attract private and corporate support to communicate how sustainability is being achieved in Biosphere reserves.
- Be a tool to promote the work of Biosphere reserves to local communities-authorities-national governments and commissions plus potential sponsors and partners.

9.1 Observations and Questions - I

- We are EuroMAB – we are the network.
- Individual Biosphere reserves and national commissions must take initiative and leadership.
- For the network to be successful – we need to make networking important and give it time.
- Before some Biosphere reserves can be expected to participate – they need to build their own capacity internally and locally, then share their experience as "learning platforms."

9.2 Observations and Questions - II

- Individual Biosphere reserves have different capacities and contexts (local-national-political support?)
- Every Biosphere reserves should have at least one staff as a contact and key coordinator (new criteria?)
- Every Biosphere reserve needs the capacity to network both formally (at meetings) and informally.
- Every Biosphere reserve needs the moral support of the Secretariat (information-resources-advice).

9.3 Observations and Questions - III

- Expectations of EuroMAB: to share experiences – bring us together – bridge our network with other UNESCO programs – support online communication.
- What can EuroMAB/Secretariat actually provide?
- They provide a valuable perspective on our network.
- What is the role of the Secretariat? Who to contact?
- Biosphere reserves need help communicating to MAB Committees - National Commissions to UNESCO – the Permanent Delegation to UNESCO – the MAB-ICC Bureau – and the General Assembly of Member States.

10. Challenges and Opportunities

- Is the MAB programme really sustainable?
- New Biosphere reserves every year – fewer UNESCO staff.
- Existing Biosphere reserves are experimenting with and are *achieving* sustainability in diverse ways.
- We need to assess the approaches and impact of Biosphere reserves and then *communicate* the key lessons.
- The EuroMAB Action Plan is a framework for strengthening Biosphere reserves as "learning platforms."

11. EuroMAB Action Plan

1. Promote the DESD through partnerships.
2. Assess participatory approaches in Biosphere reserve management and measure success of process and outcomes.
3. Improve our online communication tools.
4. Increase our participation in online networks.
5. Initiate informal thematic working groups.
6. Support research and then share and use results.
7. Document our best practices and lessons learned.
8. Communicate our experiences within EuroMAB (Biosphere reserve responsibility) and outside to WNBR and globally (Secretariat) with the E-newsletter or new online magazine and media partners.

12. "Achieving Sustainability"

1. How does your BR achieve the full scope of sustainable development locally?
2. How is sustainability defined in a local context?
3. Examples of specific activities at local BR and national MAB level?
4. How is the BR used for educational activities and partnerships?

13. "Communicating Sustainability"

1. How does your BR share knowledge?
2. How does your BR make links between science-policy-practice on the ground?
3. How do you evaluate the effectiveness of sustainable development or education or participation inside/outside your BR?
4. What tools do you use for public participation?
5. What lessons can you share? Capacity needed?

Thematic Issue - II

How to enhance the capacity of biosphere reserve to mitigate/abate and adapt to climate change?

Background

In a context of rapid environmental changes with consequences on socio-economic trends, adaptive capacities to deal with changes are needed both for social and ecological systems, both for biodiversity and for human societies. Resilience, adaptive management and adaptive governance are paradigms which are being addressed in such complex socio-ecological systems that are biosphere reserves. Some projects are focusing on climate change in biosphere reserves, used as monitoring sites (i.e GLOCHAMORE, MARS Network). What methodologies, tools, experience can be shared to reach policy makers and society?

Key Issues

1. How can a biosphere reserve mitigate and adapt to climate change? How can they contribute to the questions of how will biodiversity and human beings adapt to rapid changes?
2. What are or shall be the contributions of biosphere reserve to understanding, monitoring and preventing changes (using mountains to coastal biosphere reserves)?
3. What are the contributions to demonstrate ways to save or substitute energy, to promote sustainable lifestyles, conserving CO2 sinks such as bogs and moorlands etc.?
4. What is the role of research in supporting adaptive management and governance in biosphere reserve, mobilizing local knowledge, practices and collective learning such as the *Adaptation through Learning* (ATL)?
5. Are there new forms of partnerships between research and civil society, new modes of innovation that can be developed and shared in the biosphere reserve? What is the role of research, education for sustainable development, knowledge sharing in this context?
6. What is the role of the different institutions/stakeholders in mitigating/preventing changes? Can you identify bridging individuals/institutions (what networks are mobilized? What governance processes?). Which knowledge was mobilized and by who? Which channels were used to share the information?
7. What tools have been and can be used (modeling, scenarios, integrated adaptation modeling for climate change –IAM))?
8. What are the linkages between zonation and adaptive management in a context of climate change?

Expected Outputs

- Monitoring sites and networking (alert sites: monitoring sites such as mountains and coastal biosphere reserves…; which tools and data to be used?);

- Sharing experience/ best practices on abatement/mitigation and adaptation to climate change in pointing out how biosphere reserves can take the lead through sustainable development model projects which reduce C02 emission and could be transferred/applied to other areas (single BR approaches or joint projects among BRs);

- Scenarios building in biosphere reserves (PRELUDE, CORMAS platform…);

- Concrete recommendations for EuroMAB Action Plan: Building on results and experience of existing climate change projects and programmes in biosphere reserves, establishing cooperative programmes …

References

Glochamore
http://www.unesco.org/mab/ecosyst/mountains/gcmbr.shtml
BRIM http://www.unesco.org/mab/BRs/BRIM.shtml
MARS Network report 2005 (pdf)
European Environmental Agency (PRELUDE)
http://www.eea.europa.eu/multimedia/interactive/prelude-scenarios/prelude
Resilience Alliance
http://www.resalliance.org/1.php
Cormas
http://cormas.cirad.fr/

Keynote Speaker: Axel VOLKERY, How to enhance the capacity of biosphere reserveto mitigate/abate and adapt to climate change?

Moderator: Andrew BELL

UNESCO Secretariat: Meriem BOUAMRANE

Presentations:
Andrew BELL, Adaptation and Mitigation for Climate Change in North Devon's Biosphere Reserve

Mikhail BRYNSKIKH, Ecological monitoring and scientific reseraches in Prioksko-Terrasny Biosphere Reserve (European territory of Russian Federation)

Klaus JARMATZ-PUHLMANN, Regional valuation of climate changes and development of adaption strategies in the „Biosphere Reserve Schaalsee"

Timo J. HOKKANEN, Biosphere reserve co-operation within the Green Belt of Fennoscandia, Tackling the environmental changes

Mitigation and Adaptation for climate change at North Devon's (Braunton Burrows) Biosphere Reserve

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1. Introduction

Addressing the causes and the impacts of climate change is high on the UK agenda generally. The UK government has funded a number of awareness raising campaigns about climate change as well as financing extensive research globally. This concern has cascaded to local government which in some areas has led to more local campaigns. It was the role of the Biosphere Reserve to augment the engagement with the community and stakeholders to provide an independent and credible scientific view in an accessible form.

Within the Biosphere Reserve in North Devon there are some very sensitive species and habitats centred on wetlands, floodplains estuary and coast. Based in the south of the UK, the challenge that may arise is how species composition might change in the whole reserve, given that the English Channel or Manche to the south will be a barrier to northward species migration.

North Devon's Biosphere Reserve is a coastal reserve based on an estuary and dune system facing the Atlantic Ocean, situated at the approaches of the Bristol Channel it experiences tidal ranges in the order of 7m. This creates a very dynamic coast where impacts of sea level rise are slightly amplified and therefore the impacts will be more acute. Further to this, some of the best natural assets can be found in the coastal strip where there are Special Areas of Conservation as well as the Area of Outstanding Natural Beauty (a national landscape designation). The issue of coastal squeeze (the reduction in area for natural habitats being reduced by advancing seas on one side and non-natural land-use on the other) would have severe implications for these zones. Historically at the end of one of the spits at the mouth of the estuary in the Buffer area, a landfill site was operated for

approximately 40 years from 1948. There have been concerns regarding the future implications for this regarding sea-level rise.

Given the range of habitats that would be impacted on, as well as the communities that would be affected by the onset of global warming and sea-level rise, the partnership for the Biosphere Reserve commenced a programme of investigation and engagement to provide scientific evidence to combine with local knowledge in order to develop a strategy for adaptation. The presentation of the findings was also used to illustrate direct and more personal evidence as to why there should be behavioural and attitude changes in order to apply mitigation measures in accord with the local renewable energy action plan.

2. Coast and Estuary Modelling

A scientific investigation and modelling study was commissioned by the Biosphere Reserve from Prof. John Pethick to consider the geomorphological changes of the estuary and near coast over the next 100 years. This involved gathering new data on the current state of the estuary as well as the historical changes that were identified from old Admiralty charts. The work produced a conceptual model of how the coast was adjusting since the last glacial period. This provided a description of processes and likely long-term trends. The second model was a mathematically driven model of the changing geomorphology in the estuary based on changing the volumes of water entering in the estuary from both the tidal prism and changes in fluvial inputs. The science behind the geomorphology modelling was developed by Prof. Pethick and has proven to be as reliable as hydrodynamic models in predicting change.

The “refinement” of the study has involved presenting it to the community and inviting them to add their own observations and data to test the predictions and assumptions in the model. Crucial to opening the debate and keeping positive exchanges were strong statements that the study was not recommending any policy at this point, and the relatively long view of the changes that were being described. Disarming the tension in this way proved very useful to having a more positive and interactive dialogue. Participants were encouraged to contribute and test their own observations against the science as well as supply data such as photographs and maps. Despite the presentations being lengthy (about 1-1.5 hours) the level of interaction was always very fresh. To date, no information presented by the community has contradicted the science, even though there were some counter-intuitive suggestions in the report.

Aside from the people with a genuine curiosity, the participants were often those who had a particular concern about a section of the coast or were concerned about the landfill site especially and coming to the meetings with strong emotions or opinions. The removal of the policy decision part in this phase gives everyone the

time to reflect on the science and contribute to it before it is used to advise the policy for managing the coast and adapting to sea-level rise.

3. Modelling Terrestrial Change

On the terrestrial aspects, there has been a great deal of activity sponsored by Central government on education and raising awareness with regard to climate change. It was for several of these programmes the Biosphere Reserve team in North Devon were asked to present scenarios and threats to the area presented by climate change. For this a terrestrial model was quickly devised using Met Office and UK Climate Change Impacts Partnership model outputs along with existing GIS data.

This model essentially combined climate change data in terms of seasonal temperatures, seasonal rainfall and changed in soil moisture content set against soil and land-cover data. The results from this are identifying areas of high change in vegetation, habitats and agricultural use. When coupled with data on existing flood plains and the increased likelihood of winter storms, the map of change was very clear.

The presentation of this data along with the messages from the other partner bodies was useful in setting the context for the application of mitigation measures. The information has been used in training events for greening businesses, schools and general education, communities and local authorities to raise awareness.

A regional planning exercise has been carried out by Natural England to produce plans for reducing defragmentation of habitats, to give room for adapting to climate change. In effect these will be areas for receiving the new species that replace those that have migrated north where the climate is equitable. The question arises as to when turf should be imported from France to reduce regional biodiversity loss.

4. Discussion

In the discussions and presentations on the coastal modelling, the participants felt that they still had some influence or power over what might yet be decided. Many people in the audiences had reported that they found the presentations immensely interesting. It also took away the immediate concerns, for many, about the immediate personal implications of some of the findings. That is not to say that there were not people with strong personal concerns over some very recent and imminent developments with regard to coastal erosion, but put in the context of describing what has been going on for 100, 000 years.

In its effort to bring science and society together it was necessary to separate at first the science and the policy. This is to develop understanding and give space

for policy development. Over the coming year the policy will be advised by the science. However it is felt that it is important to maintain the scientific advice live in psyche of the people so that difficult policy decisions can at least be developed on an informed basis with public participation. It was particularly through these exercises that the value and niche of the Biosphere Reserve was bringing science and society together and taking the very long view.

The key question is whether this work has been effective in increasing the action to adapt or mitigate climate change in an appropriate way. Within the area there is tension regarding the impact of windfarms on the landscape, also there is the concern over the impact and use of biofuels. However, there has been growing interest from the domestic householders in micro-renewable energy systems such as ground source heat pumps, solar, energy efficiency. These may have arisen from the national and region campaigns on climate change mitigation. The evaluation of the approach could have been tested by measuring attitudes before and after presentations and comparison with the work in developing the coastal policies 10 years ago. The objective for the reserve is not only a region with a sustainably managed coast and a low carbon footprint, but with a community that actively decided on these outcomes. It is rational therefore to measure the participation and attitudes to see the effectiveness of the approaches.

The original coastal model proposal was to develop a mathematical model for sea level rise around the coast and model the impacts of the responses arising from various human interventions such as removing flood defences, maintaining defences, building new sea defences or do nothing.

From these scenarios a computer game was to be developed for wide circulation and people to play and see the results of their coastal management decisions in terms of habitat losses and gains, financial costs, property losses or gains. It was expected that the game would transmit the scenarios and their results back to a server where the frequency of various tested options and their results could be analysed. Funding is not yet available for this part. Had it been, we might have learnt more about the attitudes of a wider range of people in the area as baseline for their attitudes to a changing coastline and hopefully see a convergence of the opinions towards a more sustainably managed coastline. This approach could be applied to any scenario exercise for climate change, where interventions of different types and scales can produce a variety of outcomes.

5. Options for EuroMAB

Apart from sharing this approach the WNBR, and EuroMAB specifically can share the science and models of how to present science to people, with a a view to ultimately having the society to make a decision. There are region climate data models being developed and rolled out through various institutions with support

from the UK Met Office and Hadley Centre specifically using the PRECIS model. This is particularly important for developing states. The model outputs from HADRM3 cover the EU and are relatively easy to obtain. There will be subsequent refinements of this model. Within MAB it is possible to amass the expertise within the network to assist other areas in their scenario planning. There is a role to consider how sites on a north-south transect can co-operate to learn lessons specifically about species change and social adaptation such that, when the time comes to move turf, customs and practices from France to the UK and from Spain to France, the regions will be prepared.

6. Acknowledgments
Prof. John Pethick, Hadley Centre Met Office UK, UKCIP02 data, Natural England, Environment Agency, UK

7. Further Information
www.northdevonbiosphere.org.uk
www.ukcip.org.uk
www.metoffice.gov.uk

Ecological monitoring in Prioksko-Terrasny Biosphere Reserve

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A very typical little corner of each bioclimatic zone of the Earth is to be chosen in order to be preserved as a model, a standard of ecological system for sake of biological and genetic diversity preservation, its research and potential fair use. This idea became fundamental for creation of worldwide biosphere reserves network within a frame of UNESCO's "Man and Biosphere (MAB)" program.

Evaluation of parameters characteristic for background, standard state of ecosystem and biosphere reserves pollution level is one of our biggest priorities. This requires development of standardized system of background monitoring stations in each reserve, where established methods will be applied for synchronous collection of data on dynamics of environmental parameters in the area of reserves location. Thus, background monitoring stations are located beyond the area of direct cultural and industrial impact, away of considerable pollution sources.

Characteristic feature of a biosphere reserve is its core area, which represents a landscape, typical for the bioclimatic zone, strictly protected and absolutely devoid of any cultural and industrial impact. Primary function of such "core" is protection and support of biological and genetic diversity of each typical biosphere systems present within reserve. In Russia area of this kind is called "zapovednik". However, abovementioned doesn't limit the role of biosphere reserves. Buffer and cooperation zones (last one is typically an area of agricultural use and recovered natural landscapes) are created with ideas of ecological education, eco-smart agricultural technologies trials and recovery of disturbed ecosystems in mind.

Biosphere reserves aim to preserve typical ecosystems of our planet, standards of a kind, and their genetic diversity in a virgin state by means of restricting cultural impact on these areas and preserving them for future generations.

In general, biosphere reserves are to provide a scientific fundament for research in the field of ecological systems' structure and function, their resistance to negative impact of natural and antropogenic factors, and also allow development of methods and technological approaches to the protection of biosphere reserves for antropogenic impact.

Finally, reserves play a role of training centers for professionals in ecological monitoring area, as well as educational centers for local communities that spread the knowledge about regional nature as well as about importance and ways of its preservation.

Fair analysis and evaluation of monitoring results distinguishing between natural and antropogenically-driven changes in ecological system state is absolutely crucial. That is the reason why not only unimpaired ecological systems (like zapovedniks) but also those that experience different extents of anthropogenic influence must be monitored. Thus, three types of locations spread out within a reasonably big area have to be established as a result of monitoring stations network and biosphere reserves planning. Fist one is the core (zapovednik) area, devoid of every kind of impact possible, and mainly aiming genetic diversity preservation, second one is an area featuring typical landscape and experiencing minor influence, and the last one is area actively used in agriculture and/or forestry. Areas featuring massive impact of construction or industry are often referred to as impact (local) monitoring sites and have to be excluded from global background monitoring systems.

Prioksko-Terrasny reserve became the fundament of biosphere reserve established by UNESCO in 1979. Back then it was inseparable from Pustchino biosphere station of Agrochemistry and Soil Sciences Institute, USSR Academy of Sciences.

Prioksko-Terrasny reserve is considered one of the first Russian biosphere reserves for a reason. It's locates in the center of European part of Russia, 100 kilometers to the south from Moscow, in the midst of big woodland of Southern Moscow region, on the left bank of Oka river. Standard ecosystems have been constantly studied for more than 50 years in Prioksko-Terrasny reserve, what is especially valuable for the sites of background ecological monitoring. Town of Pustchino, the Research Center for Biological Studies of USSR Academy of Sciences is located on the other bank of Oka river, supplying qualified and motivated professionals for conductance of complex monitoring studies. Zapovednik ecological system is comprised typical as well as unique species of plants and animals of central part of Russian Plain.

Prioksko-Terrasny biosphere reserve occupies area of 5 thousands hectares and serves the core of biosphere reserve. It's strictly protected from all possible kinds

of impact. Buffer zone was established in 1982 and originated from the lands possessed by Experimental Forestry Park "Russki Les" and some agricultural establishments. Buffer zone encircles the reserve core with a stripe of land 2 kilometers wide. Cooperation zone corresponds to Serpukhov sub-region of Moscow region. This area is represented by natural woodlands, experiencing minor impact of sanitary cutting and recreation, and areas in possession of local agricultural enterprises. Thus, overall area of biosphere reserve including all three zones is 50 thousands hectares.

Majority of goals set by UNESCO were being executed on the regular basis since the reserve's establishment year of 1945. However, ecological monitoring was an absolutely new challenge for research groups of Prioksko-Terrasny reserve and institutes of Academy of Science.

Ecological monitoring research spans across all three zones of biosphere reserve.

Complex ecological monitoring system is divided into three self-contained sub-systems, geo-physical, geo-chemical and biological, each with its own, proper set of parameters and methods. However, complete image of environmental condition and its changes may only be created by means of use of full set of available tools and approaches.

Geo-physical monitoring includes meteorology elements dynamics, radiation, heat and water balance of the area, spectral parameters of solar radiation, especially within ultraviolet area of spectrum, integral atmosphere opacity, its humidity and aerosol composition.

Geochemical monitoring aims to monitor chemical composition of air, precipitation, fluvial and ground waters, soil, as well as plant and animal tissues. The overall goal of this sub-type of monitoring is to trace pollutants' migration and transformation routs within and in between natural ecological systems.

Biological monitoring aims evaluation of spatial and temporal changeability of ecological systems compounds. Biota is extremely sensitive to natural and anthropogenic factors changes. It provides immediate information about the reaction on leaving beings, or ecological systems of different level on influencing factors. Precise evaluation and description of biota's baseline conditions at the reference point followed by regular monitoring for deviation from such reference point is the fundament of biologic monitoring. Parallel coordinated geo-physical and geo-chemical monitoring allows making suggestions regarding reasons of biota and its distinct compounds changes.

Within biological monitoring program three levels of biota compounds evaluation exist. Such studies are conducted 1) on the level of reserve as ecologic region, 2) characteristic ecological systems level is represented by research of typical ecosystems reserve is represented by, and finally, 3) research on the last level targets distinct biota compounds, such as plants, animals and other species.

Each year these studies are made possible by members of more then 15 research institution who are involved in more then 20 research projects.

As a part of geophysical monitoring, the complex evaluation of upper basin of Oka river was performed shortly after biosphere reserve establishment, along with a number of other projects.

Before national park was granted its current status of a biosphere reserve it also had a system of monitoring locations. Major change caused by the change of status was the expansion of monitoring interest area over the boards of reserve. Within the time period of 1981 to 1982 five new constant monitoring locations were established outside the reserve borders, in buffer and cooperation zones.

Constant monitoring locations had been equipped with measuring tools for meteorological parameters, heat, water and radiation balance and pollution level evaluation. Additionally, monitoring system locations sometimes served a trial platform for new monitoring methods and meteorological equipment.

Reserve stuff was not only involved in research and conservation work, but also invested significant effort in building and conduction of educational and propaganda programs.

It's noteworthy that Pustchino Research Center USSR Academy of Sciences and Prioksko-Terrasny reserve help the leading position in biosphere research in the country. Pustchino Research Center hosted numerous conferences and meetings within the frame of the "Man and Biosphere" program, as well as annual meetings of Soviet ranch of Man and Biosphere program where progress and perspectives of biosphere reserves system were discussed.

Not only number of monitoring locations has been recently changed, but also a viriety and number of measured parameters has grown significantly.

In 1995 as a result of 2nd World *Congress* of Biosphere Reserves in the city of Seville the Seville Strategy had been accepted. As a result of that ecological monitoring gave its leadership away to social affairs in terms of focus and priority in biosphere reserves.

Currently background monitoring system in the reserve is 100 per cent functional and runs full time. It was issued the international number what allows it conduct ozone layers studies.

Following are examples of parameters complex background monitoring system records on the regular basis:

Air samples collection and daily detection of 10 parameters, including dust, SO4, SO2, NO2, Hg, Pb+Cd, PCB;

Precipitation collection and monthly detection of 16 parameters, such as cations, anions, heavy metals, PCB, pH, SO4, NO3;

Snow samples collection, including evaluation of salts content, heavy metals, PCB;

Surface waters samples, including evaluation of salts content, heavy metals, PCB;

Soils samples collection, including substrate and vegetation, including heavy metals and PCB detection;

Hourly ozone concentration scans by EMEP program;

Hydro-meteorological and radiation recording according to class 1 meteorological station standards (6 supervision in day);

Evaluation of ground waters level in 6 wells;

Sample precipitate acidity evaluation after each precipitation.

Continuity of meteorological data collection allows creation of seasonal climate portrait and characterization of climate dynamic in Prioksko-Terrasny reserve. The fact that backgrouund monitoring station is located immediately in the reserve is important and lets the use of data collected in other research projects conducted in the reserve.

Animals and plants research is a big part of research activity in the reserve. Rare and endangered species are studied here extensively. Results of this research became a part of geographical information system (GIS) project, which was complete and published as the reserve atlas in 2006.

A part of our work within International Joint Complex Monitoring Program is one of the top priorities. Our impact to this program is focused on the anthropogenic

effect on flora. Completion of the project requires many years of dedicated and intense work.

We are very exited and proud of our work on dynamic of arboreous and dumetosous species under influence of hoofed mammals. Results of this research represent a curious trend towards the conversion of pine forests to deciduous forest which will inevitably take place if number of hoofed mammals remains on the same level and doesn't decrease dramatically. This will in turn cause changes in lower tier of forest and grass, and subsequently aggravate animal species composition of the reserve ecosystem.

The joint Russian-German research project "Volga-Rein" started in June 2004 near town of Puschino, in cooperation zone of the reserve. Automated meteorological and hydrometric stations constantly collect data on fluid and solid flow of the minor river, quantity and intensity of precipitation, wind speed and direction, temperature and relative humidity of the air, total sun radiation, and soil temperature on the different depths. Data collected is generously provided to Prioksko-Terrasny reserve and is included into the general pull of complex ecosystem monitoring data.

What can UNESCO-Biosphere Reserves do to climate protection?

Klaus JARMATZ

Schaalsee Biosphere Reserve

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Currently climate change is one of the greatest challenges of mankind. All over the world the consequences, storms, draughts, heavy rainfall, flash floods etc. are noticed and effect our whole earth.

That means the problems are global, but people do not live in global communities. People live together with other people in local neighbourhood, they are ingrained in regional communities. So biosphere reserves can play an important role: on the one hand they are positioned local and otherwise they are parts of a global network. Therefore biosphere reserves are outstanding places for exchange of experiences concerning different strategies against climate change and for environmental protection. Never mind ether in Germany, Europe, Africa, Asia or America. Biosphere Reserves are convenient localities or laboratories of social learning, environmental surveillance and monitoring. But up to date the international network of monitoring is not really existent or works active. So we have to put something into action all around the world urgently.

Biosphere Reserves create a world wide network of model regions of sustainable development and promote scientific, ecological, social and economical projects investigating the impact of human activities on natural systems. Sustainable development is the overall goal for Biosphere Reserves which needs to be achieved locally fully taking into consideration impacts and consequences of global challenges, such as climate change, and their distinct local impacts.

Concerning climate change and climate protection we have a wide thematic range with a lot of questions. Exemplary:

- How important are bogs and woods for CO_2 and CH_4 reduction?
- How is climate protection conformable with the requirement for occupational and recreational mobility?
- How expensive is climate protection on regional level?
- What are the costs of precaution and adaptations to climate?

There are no single turnkey solutions but passable methods. It is time for acting on international, national and regional level, resolved and speedy by all MaB-partners. The great advantage of UNESCO-Biosphere Reserves is the existence of

a world wide network of regional management centres to follow up climate protection and adaptations to climate changes with a holistic approach ("learning laboratories").

But we have to realize there is no protection of climate without changing our consumer behaviour. We have to change a lot in our everyday life to diminish emissions. Education and intelligence are the focal points for changing our thinking and behaviour (e.g. UN-decade education for sustainable development 2005 – 2014).

We have a lot of research and development, but insufficient practical proving. That means Biosphere Reserves have to do exactly this, we need more courage for testing. Mistakes and trouble could happen, but we have to learn from the failures.

Unfortunately many scientists and experts regard Biosphere Reserves as passive influenced by the climate change than as important and active stakeholders. This we have to change very fast. The contribution of Biosphere Reserves can be manifold: Conveyance of informations, promotion of environmental education and training (education for sustainable development), build up and implementation of environmental surveillance and monitoring (regional and global), conservation of biodiversity, enhanced improvement of disturbed landscape ecosystems etc.

Promotion of renewable energies is one of the most important established fact reducing the impacts of climate change. The central point is the active participation of local population and stakeholders (Agend-21). Groundbreaking pilot projects support the development of sustainable utilisation of limited resources. For instance: decrease of energy consumption, raw material saving, cycling of raw materials, regional economic cycles, short routes of transport, sustainable tourism, organising of regional networking (Agenda-21) etc.

14 UNESCO-Biosphere Reserves exists in Germany. For instance the UNESCO-Biosphere Reserve "Schaalsee" (309 km²). Since may 2004 the UNESCO-Biosphere Reserve Schaalsee works closely with the industrial partner and sponsor Honda Motor Europe (North). The partnership is built in the focal point of mankind, the protection of our climate. As we started the co-operation in 2004, we could not foresee the international importance, the climate protection campaign just achieved.

About 5.200 ha of the area are bogs. Supported by industrial partners and sponsors (Honda Motor Europe (North) and others) we carry-out a lot of activities in wetland and bog restoration. One ha of bog can accumulate up to 1.500 kg CO_2-C/year by growing sphagnum moss (equivalent 5.500 kg CO_2/year x ha). ON

the other hand one ha of drained bog can release up to 6.500 kg $C0_2$-C/year (equivalent 24.500 kg CO_2/year x ha). That means growing bogs are very important carbon sinks, the most important on the continents. Unfortunately most people and some climate scientists also, ignore that fact. The damage of bogs boosts intensive global warming. So the protection of bogs is an important contribution to climate protection.

In November 2006 Honda Motor Europe (North) together with EUROPARC-Deutschland and the Potsdam Institute for Climate Impact Research (PIK) organised the Potsdam conference „What can Biosphere Reserves do to climate protection?“

More than 150 researchers from the natural and social sciences, environmental activists, economic representatives and politicians discussed together to generate interdisciplinary insights and to provide society with sound information for decision making. The results show: A very close alliance of all partners and stakeholders is necessary for solving this urgent problem of mankind.

In November 2007 the three partners organised successful the II. Potsdam conference under the headline „Offensive innovation for climate protection“. This will be going on in the future, next conference is planed in autumn 2008.

Currently we implement the project “Regional appraisal of climate change and development of adaptive strategies to necessary precautions on the model region Biosphere Reserve Schaalsee”: The project main aims are:

- Integrative pilot project for assessment of climate changes in the biosphere´s region
- Management of the consequences of climate change for different domains and how can adaptation to climate change in the Biosphere Reserve and beyond be improved by means of public participation or by other innovative management approaches.

The Biosphere Reserve Schaalsee (and others) generate added value by providing sites and opportunities for experimenting with and learning about improved adaptation to climate change. In addition Biosphere Reserves provide opportunities for scientific and non-scientific actors to work together and engage in defining the research and policy relevant questions collectively. The future of Biosphere Reserve governance and the emergence of adaptive management regimes have significant innovation potential. Lessons learned in the Biosphere Reserve Schaalsee related to adaptive management, indicate that the worldwide network of UNESCO-Biosphere Reserves with multi-actor networks and platforms for discussions, negotiation, learning and research, are better equipped

to deal with the challenges of climate change and the development of adaptive strategies.

Therefore some conclusions for MaB-program are:

- International strengthening of the network of research, environmental surveillance and monitoring
- Improvement of exchange of experiences in regard to precise projects
- Better use of local experiences for global network
- Better use of UNESCO-Biosphere Reserves as learning laboratories and localities for the UN-decade"Education for sustainability"
- Use of UNESCO-Biosphere Reserves for regionalisation of climate protection and adaptations to climate
- Restoration of landscape ecosystems where disturbed
- Playing an active role in regard of climate protection and education for sustainable development boosts the image and degree of popularity of UNESCO-Biosphere Reserves on regional, national and international level.

Tackling the environmental changes within the Green Belt of Fennoscandia

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Abstract
Local human activities (e.g., intensive forestry) have caused visible environmental changes at local level in the border area between Finland, Russia and Norway. The global influences such as the greenhouse effect, are parallel with them. Environmental problems are caused by people and the work with people is emphasized in BRs: the key is to assemble the right set of partners and to find the persons to make the change on all relevant levels. The benefits and actions are in villages often differ from those valued in the administration. It is obvious that politics and economy need to be considered relevant in the set of BR tools.

1. The changing border area nature

The middle part of the border between Finland and Russia has been in the same location from 17th century. Border area population has been scarce and exploitation of the nature less intensive than near population centres in southern – western parts of Finland. Nature has maintained features of wilderness. The same is true in Russia. The border area includes many nature reserves and two biosphere reserves (North Karelia Biosphere reserve in Finland, in the South, and Laplandskiy BR in Russia, in the North).

The border area from the Gulf of Finland in the south to the Arctic Ocean in the North is called The Green Belt of Fennoscandia (GBF). GBF is a set of nature reserves representing the Nordic nature, but it also is a unique ecological corridor from South to North and from East to West. From the BR point of view it is a target area for joint environmental activities to achieve environmental and societal goals.

This discussion concerns the southern – middle part of the Green Belt (Figure-1). The economy of the areas is based on forestry; in Finland also tourism is a noteworthy source of income. Population is less than one inhabitant per sq km^2. Income in the area is less than the average in Finland and in EU.

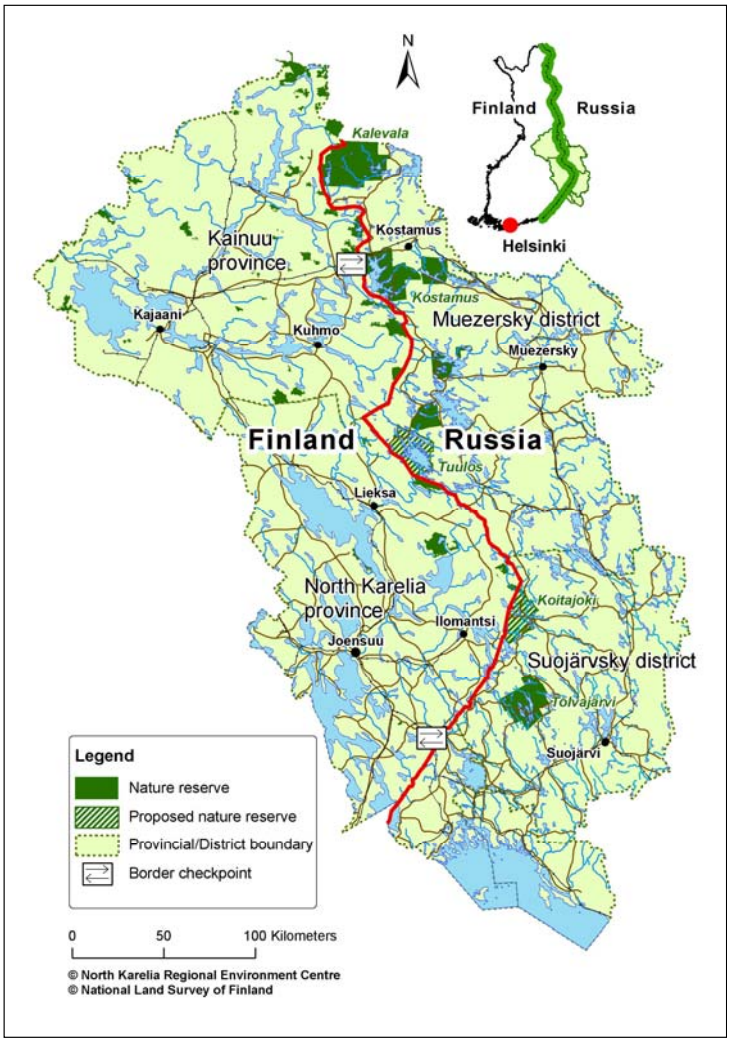

Figure-1. The Midle Part of the Green Belt in Europe

The border area has been exploited increasingly the last 50 years. Forestry has been intensified, and the villages are being abandoned. As a result, the former agricultural fields are now growing bushes, and also the forests are all bushes after clear-cuts. The nature is largely the same in Finland and in Russia, but the societies seem to be growing apart from each other. The former agrarian – forestry society in Finland is changing to a service society, where tourism has an important role. In Russia forestry is still strong, but it is weakening and nothing seems to be coming instead.

As the main influences on nature are human influences, the main focus is on people: the challenge comes through the small population – how to get a working combination of actors who will, and can, make the change? The BR alternative is to seek partners and development paths based on the natural strengths.

2. Sustainable development "windows"

North Karelia BR seeks a position as a centre of environmentally friendly development innovations for the border area. Science needs to be the basis of the BR work, and this process is slow and expensive. Local people and municipalities, on the other hand, expect actions and visible results quickly.

The keyword is motivation: planning and implementation need to be co-operative between the main stakeholders, administration and scientists. BR activities and environmental issues must be integrated in the decision making to be everybody's concern instead of being considered separate issues dealt with by devoted persons only.

Biosphere reserve offers “windows” through which the nature and environmental issues can be seen tangible from the point of view of the society, administration and scientists. In North Karelia tourism and bio-energy are examples of “windows”, which help to understand the chosen pathways.

3. Biosphere reserves have an obligation to co-operate

The BR is necessary in catalyzing and maintaining co-operation activities, and its role is even emphasized in areas with low population. Information needs to be “translated” understandable for local people. If there's no area - i.e., no BR - and no focus, there is no need to translate and information will be in too general terms to provoke thoughts and, especially, actions. Local connections make issues more understandable and raise activities.

BR is a neutral platform to seek the necessary partners, and BR directs thinking to find the common denominators to facilitate actions. In remote areas partners need to be found outside the area. The scientific community has created BRs and this link is still valid. BRs also offer links to the international partners.

Project life needs continuity. Short-term actions are ineffective in making the change without structures keeping the results alive and building future on them. Thus, when working properly, a BR will grow in importance when the results, expertise and contact networks will pile up and grow.

4. Chained projects make processes

Scientific studies have been done extensively on both sides of the border by various scientific institutes and by the biosphere reserve. Scientific projects will

involve the local people whenever possible. Development projects need more labour and they are usually more visible during their whole existence and after completing the tasks. Entrepreneurs and enterprises as partners normally make use of the results, too. Co-operation with authorities will combine the ideas and principles to working practices and visible regional goals which can then be manifested as, e.g., development programmes.

Karelian Nature School, as a BR partner, is an example of the chain how minor village actions will grow to a major sustainable development effort. Karelian Nature School includes environmental education for all age classes, a network of sustainable tourism enterprises and extensive training of tourism entrepreneurs. The formula is well tested, still under development and being adopted also elsewhere.

Giant hogweed is a notorious invasive plant which seems to benefit from recent environmental changes. The BR started to work on it for five years ago, and now c.a. 1300 sites are being managed. This activity has created a good network of actors, better understanding of the environmental changes and versatile environmental management actions.

Development of new remote sensing methods has offered opportunities to effectively detect changes, and it greatly helps in planning and visualizing various issues. Remote sensing methods have been used on both sides of the border together with intensive field inventories. The results will be used in planning nature use, creating better ecological networks and also helping development of nature tourism.

5. From joint operations to joint environmental policy at the border area

The GBF makes up ecological corridors from South to North and from East to West. It serves as a spreading channel for various organisms, but it also allows detection of alterations in the nature caused by climate change. Dealing with an extensive area and extensive issues needs tools for all organisational levels.

On international level a transboundary BR (or several of them) would be needed. It would make it easier to pursue common environmental policy at the border. The international status would also raise the visibility and increase possibilities for new actions.

The biosphere reserve has already been taken into account on regional and municipal level in various programmes. However, the full utilization of BR status and development options is still sought after by promoting alternative means of living for the local people. This task obligatorily requires co-operation with municipalities and regional development organisations.

Working on municipal and regional levels is also playing with politics and politicians. This is important, because resources used for "development" are huge compared with the money used for "environmental" issues. And after all, these are the sides of the same coin. Pushing the environmental issues to be a part of the local development gives much greater opportunities for financing than relying on the highly competed funds earmarked with "environment". Development "windows", such as bio-energy and tourism, can be used as commonly accepted and understood tools to direct thinking. They allow taking part in the societal discussion, but also including practically any environmental issue in the BR activities. If an issue can be seen through the "window", its meaning and importance in everyday life is more easily understood.

6. References

Blomberg, T., Hokkanen, T.J., Kaskor, V., Kokovkin, T., Kravchenko, A., von Numers, M., Potakhin, S., Puurman, E., Schelekov, A., Vuorio, V., Yakovlev, E. & Öhman, M. (eds.) 1999. The Biosphere Reserve concept in the Nordic countries and their cross-border regions. Tema Nord 1999/522. Nordic Council of Ministers, Copenhagen. 146 p.

Eisto, I., Hokkanen, T.J., Öhman, M. & Repola, A. (eds.) 1999. Local involvement and economic dimensions in biosphere reserve activities. Proceedings of the 3rd EuroMAB biosphere reserve coordinator's meeting. Publications of the Academy of Finland 7/1999. Edita. Helsinki. 365 p.

Hokkanen, T.J. & Ieshko, E. (eds.) 1995. Karelian Biosphere Reserve Studies. North Karelian Biosphere Reserve. Joensuu. 267 p.

Isokääntä, O. 2007. Enchanted by nature. Getting acquainted with the border area nature. Kainuu Regional Environment Centre. Friendship Park Research Centre. Kuhmo. 122 p.

Lehtinen, A.A. 2006. Postcolonialism, multitude, and the politics of nature. On the changing geographies of the European North. University Press of America. Lanham, Maryland, USA. 299 p.

Lähteenmäki, M. (ed.) 2007. The flexible frontier: Change and continuity in Finnish - Russian relations. Aleksanteri Series 5/2007. University of Helsinki. Helsinki. 266 p.

Terry, A., Ullrich, K. & Riecken, U. 2006. The Green Belt of Europe: from Vision to Reality.IUCN. 214 p.

Thorell, M., Olsson, O. (eds.) 2005. Nordic Biosphere Reserves. Experiences and co-operation. Tema Nord 2005/560. Nordic Council of Ministers, Copenhagen. 138 p.

Conclusions from Thematic Issue – II
How to enhance the capacity of biosphere reserve to mitigate/abate and adapt to climate change?

Andrew BELL
Moderator

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Arising from the discussions in the session the following themes, often inter-related emerged.

Sites for monitoring change (including climate change)

Biosphere Reserves are currently used to a large extent for monitoring change on an ecological level. For many sites there are data that extend for the entire life of the Biosphere Reserve and in some cases prior to that as a site that had been nationally protected. It certainly had been shown in various works how such information had been used and could be used more widely to model changes and impacts arising from climate change and to filter out the changes not arising from anthropogenic climate change. Understanding that Biosphere Reserve have a very good history generally of monitoring the key discussion was how to make best use of that information and promote it to the wider world for its use. Although there are 233 sites within the EuroMAB region, there are also a host of other sites and networks that have an equal or larger leverage in terms of scientific understanding. Monitoring to accurate standards is expensive and rather than present MAB sites as yet another network, it would be better to promote MAB sites within existing networks, such as Biodiversitas and LTERnet (network of Long term environmental research), Environmental Change Network Sites, UNEP Alert Sites, etc.

Further to this, the Biosphere Reserves are in advance of other sites of incorporating socio-economic changes, which can be coupled to the environmental data. A new network of these sites is being established. Whilst the secretariat is also working with these organizations on an EU level, it is worth each country raising awareness with their national contact authority for these other monitoring networks.

It has been suggested that the MAB networks might establish thematic networks such as mountains, coasts, etc. A response to this was similar to that as above

where the MAB reserves could add value to existing thematic monitoring networks. That was not to say that similar reserves should not be communicating.

Modelling the Future

Arising from the ecological modelling is the ability to synthesise the information and produce scenarios for climate change. The recurring phrase was to remove the policy panic. This means to separate the communication of challenging science from immediate (i.e. simultaneous) policy decisions and give time for the science to advise an appropriate policy response; for example; managing coastal change, or land-use. Occasions had been cited where the immediate knee jerk reaction to a scientific issue was not the most beneficial. The UK Climate Impacts Partnership (www.ukcip.org.uk) was highlighted as a good case example of where to access data to develop scenarios on a more local or regional scale given the 50Km grid outputs for changes in conditions. A higher resolution of data is expected soon. The opportunities are therefore improving for the Biosphere Reserves to carry out various scenario models for their areas, and share the experience of the development and use of these scenarios. It has been indicated that often the science behind the scenarios was not as important as the participation of the stakeholders developing them. Through scenario modelling and proving, the adaptations can be built into regional planning and therefore establish greater resilience within ecosystem and the services they provide. Through appropriate land planning, space can be made for the flow or migration of species as climate bands shift. It is important to build into these scenarios the cost benefits of adaptation and mal-adaptation.

Learning for all

The communication of science to people is vitally important in the process of scenario building for climate change. It should be stressed as good practice that scientists working in Biosphere Reserve areas should communicate their science to the local people as a condition of working in the area. The translation of that science into local school and community education initiatives serves to embed the information in the people so that behavioural change is more possible with an informed audience. It must be stressed that the science informs the policy and does not dictate it.

This is a significant contribution to the UN Decade of Education for Sustainable Development in terms of education policy change and its delivery.

A particular uniqueness within EuroMAB has been trans-boundary reserves as seen in the Vosges du Nord and Pflatzwald, Fennoscandia Belt, and the Czech Republic/Poland/Romania. These offer particular insights on working cross cultures on common issues bringing a particular diversity to the approaches. It was felt that there might be particular support and highlighting these areas.

Turning the Science into Policy and Action
Having stated that there is good practice in putting time between science and policy decisions; there is the need to act now to mitigate (reduce emissions, or sequester carbon) as well as adapt (change practices to cope with the change that is inevitable). This is driven by the urgency of the very recent climate change predictions. Further to this it is important that the role of Biosphere Reserves, MAB and UNESCO are clear within the UN Framework and how they add value to the existing work of UNFCCC, IPCC, UNEP and UNDP. Recent informal discussion have indicated that Biosphere Reserves have an important job in applying and testing policies to demonstrate to the wider world; fulfilling their function "learning laboratories".

Various reserves had expressed examples of mitigation through carbon sequestration or through forestry or wetlands and the capacity with the reserves to do even more. Most reserves are large open regions that have the potential to sequester large amounts of carbon. Further to this, the reduction of N_20 from soils and the energy associated with intensive agriculture can be diminished in Biosphere Reserve areas. Working with communities reserves should not restrict themselves to the land based mitigation measures. Fuel efficiency and energy production are also valid mitigation measures. Wienewald Biosphere Reserve has been particularly strong in demonstrating the application of renewable energy. If urban reserves are a developed their significant contribution to climate mitigation will be on energy efficiency and renewable energy production and consumption.

Examples of adaptation had not been represented very well within the workgroup. There had been coastal re-alignment measures in North Devon, in Germany there was forward planning for adaptation through extending and establishing wetlands, this was also being explored in the Czech Republic to adapt for water shortage measures.

Economic adaptation had been shown in some ski resorts to remove boulders from the dressed ski-slopes to reduce the dependency on deep snow. This does have an ecological impact for the reptiles that rely on these stony areas as basking areas etc. There has also been economic adaptation in terms of developing more summer based tourism for the area.

Strengths of EuroMAB
In developing an understanding where EuroMAB could deliver some actions to fit in with other organizations, the group explored the strengths of EuroMAB. They were highlighted as follows:

- Existing and robust network with diversity as a strength the network has been in existence for some time and the organisations are used to the concept of working together. The diversity of the network also brings strength.

- Model sites for sustainable development applying science and policies for climate changeThis is a major policy drive for the MAB network generally and where their uniqueness is not the individual actions but the fact that they all happen together in Biosphere Reserves.

- Inter-disciplinary (within and beyond UNESCO) Biosphere Reserves are key sites for the application of measures and research for all the intergovernmental science programmes including MOST (Management of Social Transformations). Outside of UNESCO, the work can be applied working with the private sectors.

- Trans-boundary reserves with cultural diversity and co-operation important sites for learning to deal with cross cultural issues.

- Socio-ecological dimensions There is a long experience on dealing with economic dimensions of sustainability within the network.

- Strong participatory approach EuroMAB has shown to be very good on demonstrating the benefits of participation and governance at the most appropriate level. This is particularly relevant in considering behavioural change in society with regard to climate change.

A vision for Biosphere Reserves and Climate Change
Biosphere Reserves should serve as model areas for demonstrating adaptation and mitigation for climate change based on sound science and high levels of stakeholder participation from which the world can learn.

Actions for EuroMAB
- Science
    - Promote the European Network of Biosphere Reserves to be included in existing monitoring networks (including thematic networks) emphasising the socioeconomic and ecological monitoring. Should be done at national and secretariat level

    - Link with other UNESCO Intergovernmental science programmes to develop climate change related science projects on Biosphere Reserves at a national and regional level.

- Policy
  - Setting up adaptation and mitigation policies strategies and actions in a range of reserves to demonstrate science and policy interaction incorporating local and cultural knowledge as well as scientific information.

  - Delivering actions with all sectors including the private sector exploring the costs and opportunities of climate change

- Education
  - Publish guidelines for Biosphere Reserve Coordinators on how to "Deal with climate change at a reserve level"

- Capacity Building
  - How to attract finance for climate mitigation projects through Kyoto Protocol and others.

- Learning
  - Catalogue of adaptation and mitigation practices in EuroMAB and beyond
  - Research and education opportunities leaflets for Universities

- EuroMAB outreach and communication
  - Use the published information via the EuroMAB platform to promote the MAB network.

- Finance for activity
  - Framework 7 Call for proposal to be investigated by Belarus
  - Interreg 4 Programme to be investigated by UK
  - Carbon Finance for application of measures

Thematic Issue – III

How does zonation of a biosphere reserve contribute to sustainable development?

Background

The identity of a biosphere reserve also relies on its specific zonation scheme which aims to serve better the three functions of a biosphere reserve. The zonation is the spatial and negotiation tool to implement the notion of sustainable development, with conservation of biodiversity being one component of sustainable development. The zonation scheme has been adapted to different contexts. The periodic review process is the opportunity for some countries to undertake some modifications, in land management, in the size and zonation of the site, in the governance scheme to better take into account changes and to better fulfill the Seville Strategy. The third World BR Congress in Madrid will address the issue of the role and impact of zonation to implement sustainable development in a biosphere reserve. What are the experience, practices and proposals of EuroMAB to the World Network in this regards?

Key issues

1. What are the roles of each zone in generating ecosystem services, employment opportunities, biodiversity conservation and sustainable development?

2. What is the contribution of each zone to conservation and development taking into consideration constraints and opportunities inherent in each zone? What are the needed interactions between these different zones to reach sustainable development?

3. How is the zonation adapted to local and national legislation and governance structure and processes?

4. How is the zonation scheme interpreted/reinterpreted vis à vis the dynamics of socio-ecological systems (including urbanization) and changes (including climate change)?

5. What lessons can be shared from interpreting the zonation scheme for sustainable development in different settings (from protected areas to heavily settled urban regions)?

6. How can these lessons, experiences and changes over time and space can be taken into account? Are there mechanisms needed to revise the zonation? Is the periodic review process the right tool?

Expected Outputs

- Lessons learnt and sharing of experience on zonation and land management in different contexts for reaching sustainable development;
- Proposals for innovative land management practices and approaches to be tested;
- Recommendations for EuroMAB Action plan and contribution to Madrid Congress.

References

Seville Strategy and statutory Framework
http://www.unesco.org/mab/BRs/offDoc.shtml
Madrid Policy Paper Sc-07/CONF.505/5

Keynote Speaker: Catherine CIBIEN and Mireille JARDIN, How does zonation of a biosphere reserve contribute to sustainable development?

Moderator: Zbigniew NIEWIADOMSKY

Presentations:
Lisen SCHULTZ, Zonation for sustainable development Lessons from Kristianstads Vattenrike, Sweden

Boris ERG, Duska DIMOVIC and Giorgio ANDRIAN, Gornje Podunavlje Special Nature Reserve Toward an improved territorial integration

Vladimir VLADIMIROV, Zonation of Bulgarian Biosphere Reserves

Karl-Friedrich ABE, The Rhön Biosphere Reserve a UNESCO Biosphere Reserve covering unique areas in three states

Yuriy GORSHKOV, Realization of principles of Siville Stratagy and Earth Charter in Tatarstan Republic

Gornje Podunavlje Special Nature Reserve - a tool for improved regional integration

Boris ERG[1], Duska DIMOVIC[2], Giorgio ANDRIAN[3]

Keywords: *Gornje Podunavlje, Central Danube Floodplains, wetland management, zonation*

Gornje Podunavlje - an extensive floodplain area situated in the northwestmost of the Vojvodina Province of Serbia, represents one of the most prolific wetland areas in the middle course of the Danube. As one of the few remained intact floodplains that sustain an exquisite biological diversity basinwise, it has been designated as a Special Nature Reserve (SNR) in 2001, being taken up to the level of the highest national conservation importance. It is located along the left bank of the Danube with the total size of 200 km^2. Ecologically, Gornje Podunavlje is part of the vast Central Danube Floodplains that encompass three neighbouring countries (Croatia, Hungary and Serbia) and cover more than 700 km^2 of protected areas only. Apart of the delta, the Central Danube Floodplains might be considered as another biodiversity hotspot in the Danube river basin. Spanning three protected areas in neighbouring countries (Danube-Drava National Park in Hungary, Kopacki rit Nature Park in Croatia and Gornje Podunavlje Special Nature Reserve in Serbia), the area brings together an exceptional biological and cultural diversity, but also three different national legal frameworks and management structures.

Although affected by numerous human activities that primarily aim to utilize its abundant resources - forestry, hunting, fishing, water management, agriculture and husbandry, Gornje Podunavlje still represents the ultimate resort for numerous wetland species. Its main natural features are significant diversity in habitats and species - oxbows, dead branches, channels, ponds, native riparian forests, wet and saline meadows, as well as various mammals, fish and bird species, many of which are endangered at the national and international level. Apart of the exceptional biological diversity, the centuries-old tradition and a vibrant history of living by the river created a unique cultural pattern all along the floodplains. Traditional ways of using the natural resources, but also customs, music and food processing survived over the centuries, representing a rich cultural heritage for this area.

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Despite high level of legal protection at the national level, the most of the ecosystems in the reserve are affected and threatened by various human activities. Drainage, irrigation and numerous river regulation works that took place in the last two centuries have largely contributed to the decrease of natural habitats, while extensive construction activities, agriculture and forestry occurring in the last few decades bring new pressures to the area. Under the management of the state forest authority, the area is exposed to intensive forest practices aimed at converting native forests into non-native tree species stands in large scale. Primarily due to internal zonation applied in Gornje Podunavlje that reflects on inappropriate management goals, most of the adverse human activities continue to take place, namely in the areas that are not strictly protected or have a low protection status. Following conservation acts at the national level, a three-level zonation system has been applied in the reserve. Only 1.3 % of the total area is recognized as a core zone - officially called the protection regime of the 1st degree; 24.7% is under the semi-restrictive protection regime of the 2nd degree where the most human activities are restricted; whereas the rest of the 74.0% falls under the protection regime of the 3rd degree, where the majority of human activities occur. Although the zonation resulted from the comprehensive scientific research on biodiversity, the distribution of the three zones doesn't provide enough space for the proper conservation of main biodiversity values. Apart of inadequate internal zonation, a network of villages that surround the reserve are not regarded as an integral part of the reserve, neither in geographical nor in managerial sense.

Nevertheless, due to its exceptional natural and cultural features, Gornje Podunavlje SNR is internationally recognized and proclaimed as the Important Bird Area (IBA) and the Important Plant Area (IPA). Moreover, there is an undergoing designation procedure of Gornje Podunavlje as a Wetland of International Importance according to the Ramsar Convention (both the Danube-Drava NP and Kopacki rit NP are already included in the Ramsar list). Gornje Podunavlje is also recognized as a potential biosphere reserve and therefore included in the national preliminary List of Biosphere Reserves of Serbia. An official nomination of Gornje Podunavlje (the nomination is officially titled *Monostorsko-Apatinski rit)* for a biosphere reserve was submitted to the MAB Secretariat in Paris in 2001. The proposal as such was regarded, but it is suggested to revise the proposed zonation and to include the surrounding villages into the transition area. There is a clear request to align the nomination with specific BR zonation requirements, not only to reflect on the existing internal zonation in the reserve but also to secure better integration of local communities that a three-level BR zonation is foreseen to provide. Apart of the BR nomination undertaken by Serbian authorities, Gornje Podunavlje SNR could be also considered within its transboundary ecological and cultural context, as part of the trilateral Central Danube Floodplains that span neighboring Croatia, Hungary and Serbia, and comprise adjacent Kopacki Rit Nature Park (HR), Danube-Drava National Park

(HU) and Gornje Podunavlje Special Nature Reserve (SRB). Since the transboundary Central Danube Floodplains represent single ecological unit, it is presumable that a BR designed in that way would adequately deliver all three main BR functions - conservation, development and logistic. Even more comprehensive concept is embraced in the proposed Danube-Drava-Mura Transboundary Biosphere Reserve, an international initiative set out in 1997 with an ambitious goal to comprise more than 40 sites in 5 countries in one large transboundary biosphere reserve.

Considering all the above, it is essential to consider Gornje Podunavlje within its transboundary context in order to ensure a proper integration of the area into the wider territorial context. Among several supportive activities launched by international organizations in Gornje Podunavlje in recent years, one of the first projects specifically elaborated to ease the transboundary cooperation in the Central Danube Floodplains was *Integrating local communities and nature conservation in the European Green Belt,* as a first site-based project within the Green Belt initiative (www.europeangreenbelt.org). Coordinated by IUCN Programme Office for South-Eastern Europe in cooperation with partners both from Croatia and Serbia, the project was aimed to strengthen transboundary cooperation and to build planning and managerial capacities of main stakeholders associated with the protected areas in the region. Focusing its activities on Gornje Podunavlje SNR, the project delivered the new habitat inventory and habitat map according to internationally recognized EUNIS classification, thus laying down a substantial groundwork for improved management planning for Gornje Podunavlje. Subsequently, the project outcomes should secure a higher public participation at the local and regional scale which is considered as necessary preconditions to the proper BR designation and integration of the Gornje Podunavlje SNR in the World Network of Biosphere Reserves.

Further readings

Stein R., Heil, P. and Tuček, L. (Eds.) (2006) *Proceedings of the 2004 International Conference and Expert Workshop of Transboundary Biosphere Reserves: Following-up on Seville+5*

Naturpark Pfälzerwald/Parc Régional des Vosges du Nord, Lambrecht/La Petite-Pierre.

European Green Belt initiative - *Integrating local communities and nature conservation in the European Green Belt* *http://europeangreenbelt.org/003.local.001.html*

Gornje Podunavlje Special Nature Reserve
http://www.vojvodinasume.co.yu/indexnivo_en.php?&nivo_1=8&nivo_2=33

Kopacki rit Nature Park http://www.kopacki-rit.com/

Danube-Drava National Park http://ddnp.nemzetipark.gov.hu/

European Life Line Drava-Mura
http://www.fluvius.com/Komponenten/European%20Life%20Line1.pdf

Zonation of Bulgarian Biosphere Reserves

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In 1977 the International Coordination Council of the MAB programme approved 17 biosphere reserves in Bulgaria: Alibotush, Bayuvi Dupki – Dzhindzhiritsa, Bistrishko Branishte, Boatin, Chervenata Stena, Chuprene, Dupkata, Dzhendema, Kamchia, Kupena, Mantaritsa, Marichini Ezera, Parangalitsa, Srebarna, Steneto, Tsarichina and Uzunbudzhak (Marichini Ezera was delisted in 2002 due to its merging with the much bigger Central Rila reserve). They represented a well developed network of biosphere reserves, more or less evenly distributed across the country. Fourteen reserves are situated in mountains – Stara Planina Mts, Rila Mts, Pirin Mts, Vitosha Mt., Slavyanka Mt., Rhodopi Mts and Strandzha Mts, and two are in lowland wetlands – Kamchia and Srebarna reserves. In accordance with the initial goals of the MAB programme, the proposed territories contained the best preserved, primary to a large extent, ecosystems and landscapes representative for the different biogeographic regions in Bulgaria. Although the minimal area of each biosphere reserves had to be at least 1000 ha, a special exception was made for Bulgaria allowing a minimal area of 500 ha due to the prevailing mountainous relief and very diverse ecosystems (Nedyalkov & Nikolov 1986). For each biosphere reserve a core and a buffer zone were designated. The establishment of the biosphere reserves fostered conservation of biological diversity in the country and was a great stimulus for biodiversity inventories, investigations into the structure and functioning of ecosystems, involvement of young generation in environmental education and training. Especially active were these activities in the 1980-ties.

The political, economic and social changes in the country after 1989 and the transition to a market economy influenced also the activities related to biosphere reserves, both negatively and positively. The main negative effect was the reduction or even cut of funding for research in these territories, and consequently, this led to delayed response to the requirements of the Seville Strategy. Thus, currently all biosphere reserves belong to the first generation of biosphere

reserves. On the other hand, however, new challenges, opportunities and trends related to nature conservation and sustainable development emerged on national, regional and global levels. On a national level, among others, special mention deserves the substantial development of the national legislation and understanding related to biodiversity conservation, e.g. elaboration of *The National Biological Diversity Conservation Strategy* (Biodiversity Support Program 1994), *The National Biodiversity Conservation Plan* (2000: for years 1999-2004; 2005-2010, *National Strategy for the Environment* (for years 2000-2006; 2005-2014), *Protected Areas Act* (1998), *Biological Diversity Act* (2002), etc.

With the *Protected Areas Act* six categories of protected areas in the country were designated: nature reserves, national parks, nature parks, maintained nature reserves, protected sites and nature monuments. No special category for biosphere reserves was accepted. Fifteen of the current Bulgarian biosphere reserves are 'nature reserves', which is the category with the strictest protection regime, and one (Srebarna) is a 'maintained nature reserve' according to the national legislation. The land in the biosphere reserves is of exclusively state ownership. With the adoption of the *Biodiversity Act* and the establishment of the Natura 2000 network the biosphere reserves "lost" their buffer zones. The functions of the buffer zones, however, are now fulfilled by the national or nature parks, or Natura 2000 sites which contain the respective biosphere reserve (see Table 1). Thus, several different cases exist in the country in respect to functioning of biosphere reserves.

Six of the biosphere reserves (BRs) are situated within 3 national parks – Central Balkan national park (with 4 BRs), Pirin national park (1 BR) and Rila national park (1 BR). The establishment of the national parks aims at conservation of biodiversity on the respective territory and providing for research, education, recreation, development of sustainable tourism and environmentally friendly livelihoods. They are exclusively state ownership, do not include settlements and have an appropriate zonation – strictly protected zones (reserves and maintained reserves, including some of the current biosphere reserves), zone for tourism development, zone of the mountain huts and administration facilities, etc.

Two biosphere reserves are within 2 nature parks – Vitosha nature park and Strandzha nature park. The establishment of the nature parks aims at conservation of biodiversity on the respective territory and providing for research, education, recreation, development of sustainable tourism, sustainable use of natural resources and encouragement of traditional livelihoods. Nature parks include land of diverse ownership as well as settlements, and also have an appropriate zonation.

Although without officially designated transition areas, in both of the above mentioned cases, biosphere reserves do fulfill their three functions – conservation,

development and logistic support. The functions of the buffer and transition areas are undertaken by the different zones of the parks. The managing bodies of the latter have the responsibility for implementing the management plans of the parks and for control of all activities within the territories, including in the biosphere reserves. Mechanisms for involvement of local populations and other stakeholders also exist. A possible and desirable option for revision of at least some of these first generation BRs is to officially establish a transition zone by inclusion of that municipalities' territories which are outside the respective national or nature park. In such a case the larger part of the park (the more strictly protected zones, including the current BRs) will represent the core and the buffer zones and the adjacent territories of the municipalities and some of the park's zones for tourism and other human activities will represent the transition zone. Moreover, the whole or part of each park's territory is designated under other international conventions and initiatives, e.g. World Heritage Convention (part of Pirin national park), PAN-Parks (Central Balkan and Rila national parks), Natura 2000 network (see Table 1), etc. This provides additional opportunities for bilateral and multilateral international cooperation with other similar sites (including biosphere reserves).

A different case is represented in the remaining 8 biosphere reserves. They are within Natura 2000 sites which fulfill the role of BR's buffer zone. In these cases the development function in the territories adjacent to biosphere reserves is weaker than that in the national or nature parks, and is largely dependent on the initiativeness and motivation of the local authorities, business and NGOs. A successful example is Srebarna biosphere reserve, which is also a World Heritage site and a Ramsar site, where active research, monitoring, training and education activities, tourism (especially bird-watching) and making of local products have been developing for already more than 30 years.

In 2007 Bulgaria celebrated the 30th anniversary since the designation of the biosphere reserves in the country. A national workshop was held which was a good opportunity for reviewing the implementation of the MAB programme and outlining of the future tasks and challenges. The efforts of the National MAB Committee, relevant governmental authorities and partner NGOs have been and will be focused on the following main tasks and activities:

- raising the popularity and explaining the modern concept for biosphere reserves, outlining the benefits of having a biosphere reserve and comparison with other "competing" or partly overlapping national and internationals initiatives and programmes;

Table 1. Relation of Bulgarian biosphere reserves to other protected areas and Natura 2000 sites *(Source: Protected Areas Act 1998; Natura 2000 Bulgaria)*

Biosphere reserve	**National protection category**	**Relation to other protected territories**	**Contained by Natura 2000 sites no.:** (**HD**- Habitats Directive; **BD** – Birds Directive)
Alibotush	nature reserve	-	BG 0001028 (HD) BG 0002078 (BD)
Bayuvi Dupki – Dzhindzhiritsa	nature reserve	within Pirin national park	BG 0000209 (HD & BD)
Bistrishko Branishte	nature reserve	within Vitosha nature park	BG 0000113 (HD & BD)
Boatin	nature reserve	within Central Balkan national park	BG 0000494 (HD & BD)
Chervenata Stena	nature reserve	-	BG 0001031 (HD) BG 0002073 (BD)
Chuprene	nature reserve	-	BG 0001040 (HD) BG 0002002 (BD)
Dupkata	nature reserve	-	BG 0001030 (HD) BG 0002063 (BD)
Dzhendema	nature reserve	within Central Balkan national park	BG 0000494 (HD & BD)
Kamchia	nature reserve	-	BG 0000116 (HD) BG 0002045 (BD)
Kupena	nature reserve	-	BG 0001030 (HD)
Mantaritsa	nature reserve	-	BG 0001030 (HD) BG 0002063 (BD)
Parangalitsa	nature reserve	within Rila national park	BG 0000495 (HD & BD)
Srebarna	maintained reserve	-	BG 0000241 (HD & BD)
Steneto	nature reserve	within Central Balkan national park	BG 0000494 (HD & BD)
Tsarichina	nature reserve	within Central Balkan national park	BG 0000494 (HD & BD)
Uzunbudzhak	nature reserve	within Strandzha nature park	BG 0001007 (HD) BG 0002040 (BD)

- establishment of at least one new-generation biosphere reserve in the country with all 3 zones created; a special challenge is the elaboration of an appropriate scheme for designation of BR transition zone, bearing in

mind the lack of special legislation and the rather unequal development of the different municipalities concerned;

- reinforcement of the scientific, monitoring, training and education activities in all Bulgarian biosphere reserves;

- promotion of good practices and building capacity at national and local levels for implementing of the Seville Strategy in the most appropriate territories, e.g. Central Balkan and Pirin national parks, Strandzha nature park, Western Stara Planina Mts territory (e.g. through the project 'Life for biosphere reserves' of the Bulgarian Biodiversity Foundation within the UNESCO Participation Programme);

- international cooperation, especially with neighbouring countries, such as Turkey and Serbia, for implementing of the modern biosphere reserve concept in the border areas, e.g. through the Turkish-Bulgarian project for Strandzha/Yıldız Mts within the UNESCO Participation Programme;

- encouragement of effective and synergistic use of the available funding, e.g. for management of the national and nature parks and Natura 2000 sites, for implementing also the modern biosphere reserve concepts.

I do believe that, although relatively 'old', the biosphere reserve concept is flexible and vital and may contribute much to nature conservation and local development in the country.

References

Biodiversity Support Program.1994. Conserving Biological Diversity in Bulgaria: The National Biological Diversity Conservation Strategy. Washington, D.C.: Biodiversity Support Program c/o World Wildlife Fund.

Biological Diversity Act. 2002. Durzhaven Vestnik, no. 77/09.08.2002 (in Bulgarian).

The National Biodiversity Conservation Plan. 2000. Ministry of Environment and Water, Republic of Bulgaria.

Natura 2000 Bulgaria. http://www.natura2000bg.org/ (accessed April, 2009).

Nedyalkov, S. & Nikolov, B. 1986. Biosphere Reserves in Bulgaria. Zemizdat, Sofia (in Bulgarian).

Protected Areas Act. 1998. Durzhaven Vestnik, no. 133/11.11.1998 (in Bulgarian).

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In 1989, when the inner German border came down, the Rhoen region switched to the middle of the re-united Germany. As one result, the Rhoen received a lot of tasks. One of them was to establish a Biosphere Reserve in a region which had been in the shade of an iron curtain. The recognition of the Rhoen as a Biosphere Reserve (BR) by the UNESCO was in March 1991. The region became a BR because it offers a mainly intact cultural landscape. And in terms of animals and plants it is one of the most remarkable areas in Germany. The Rhoen region is called “Land of open Vistas” because from any higher point you have a far and open view over a richly structured landscape with forests and grassland (Photo-1).

Photo-1. The Rhön Biosphere Reserve: The Land of open vistas.

1. Data of the BR Rhoen

A special feature of the Rhoen is that it is a transboundary BR, covering parts of three federal states: Bavaria, Hesse and Thuringia. Therefore there are also three administrations.

Total area: 1,850 km² (of which: Bavaria: 728 km², Hesse: 636 km², Thuringia: 486 km²)

Population: 136,000 in 67 communities,

Population density: 79 inhabitants per km²

Overview of the three zones with their characteristic functions - Land use, Employment and Contribution to sustainable development (Figure-1**).**

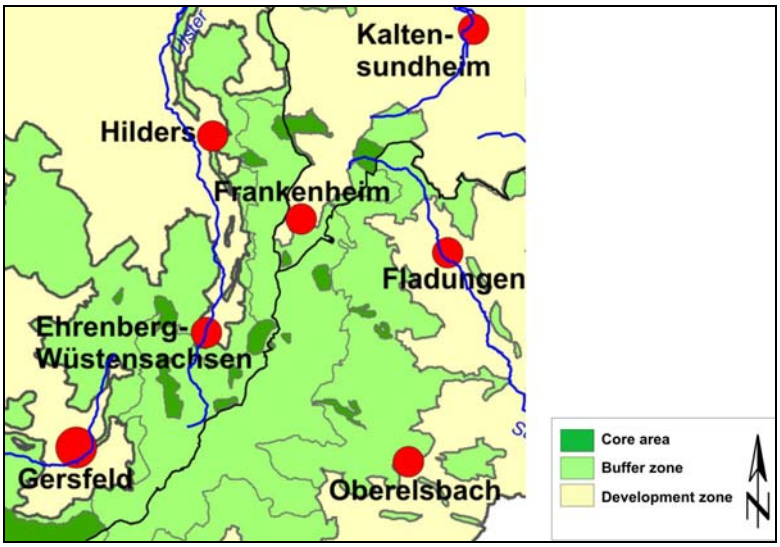

Figure-1. Zonation of Rhön Biosphere Reserve *(section)*

Basis for zonation: analysing the inventory of valuable plants and animals as well as biotops

Process of zonation:

- Creating proposals for the three zones
- Discussing the proposals with experts and local people
- Fixing the three zones by recognition of respective biotops as protected areas

2. Zones in Detail

Core area - does not play a central role, it is the smallest part (ca 2%).

Land use: area for the "jungle" of tomorrow - a wilderness without any human impact (Photo-2).

Photo-2. The Core area - the “jungle” of tomorrow.

Contribution to sustainable development:

- Study and research (what kind of forest would be the natural and genuine one of the region).
- area is strictly protected as a nature protected area

Buffer zone - comprises areas of special importance to the character of the Rhoen landscape (ca 30%)

Land use and employment:

- zone contains large near-natural areas with a richness in species and structures together with near- natural forest, but with agricultural use = maintaining by using.
- continuation of *traditional* land use is of highest importance in this area (e.g. sheep farming) (Photo-3).

Contribution to sustainable development

- Protecting the core area from human impacts
- Maintaining the biodiversity and the landscape character

Photo-3. The Buffer zone- continuation of land use (e.g.sheep farming)

Development zone - covers the largest part of the BR Rhoen (ca 68%); it is the most important area for the economic development (Photo -4).

Photo-4. The Development zone – most important area for economic development.

Land use and employment

- agriculture and forestry (best conditions in this area)
- great portion of settlements
- industrial areas.

Contribution to sustainable development

Developing new methods for producing / marketing of regional products without destroying the biosphere and with that creating new jobs for local people (Photo-5).

Photo-5. All visitors can see: Here is a UNESCO Biosphere Reserve.

3. References

Framework Management Plan Biosphere Reserve Rhön

Realization of principles of Siville Stratagy in Tatarstan Republic

Yuriy GORSHKOV

Volzhsko-Kamsky National Nature Biosphere Reserve (Kazan)

Russia

In 2005 the Presidium of the International Coordination Board MAB UNESCO approved the nomination of the Great Volzhsko-Kamsky Biosphere Reserve. The UNESCO certificates as the units of the Reserve received the Raifa part (Raifa Forest) and Sarali part (Sarali land between rivers) of Volzhsko-Kamsky national nature reserve. These units include the core arrears, buffer and transition zones (Fig. 1). The certificates presentation took place during Kazan Millennium celebration.

The core zone of the Raifa part is comprised by one of the oldest in Eastern Europe massive of sub-taiga, which is located in the middle of agrocoenosis and urbanized landscapes, and is the unique center of landscape and biological diversity preservation in the region. Sarali part, which is comprised by the nemoral forest with steepefield portions and the system of gulfs and bypasses of the largest in Europe Kuibishev Reservoir, plays an important role in preservation and reproduction, first of all, of the aquatic and semi-aquatic fauna of the region. Raifa part of the reserve has been the polygon for the nature study programs since the 80-ties of the XIX century. From 40-ties of the XX century the regular monitoring of processes in nature take place on this territory. The complex studies of the biocoenosis in the Sarali part were started in the end of 40-ties of the XX century. The territory of the BR is distinguished for its biodiversity. The natural communities of coniferous, mixed, broadleaved forests, meadow steppes, herbaceous and sphagnum swamps, meadows and lakes are present here. On the territory of the BR 900 species of higher plants, 180 species of mosses, 210 species of lichens, more than 800 species of macromycetes, 343 species of vertebrates were registered.

The Presidium of the International Coordination Board MAB UNESCO recommended to enlarge the territory of Biosphere Reserve – to prepare the nomination on supplementary units, which are answered to the Seville Strategy goals.

The most suitable arrears as units of Biosphere Reserve are the territories of regional nature refuges Sviazhsky and Spassky, which are situated in the Volga valley (Figure-1).

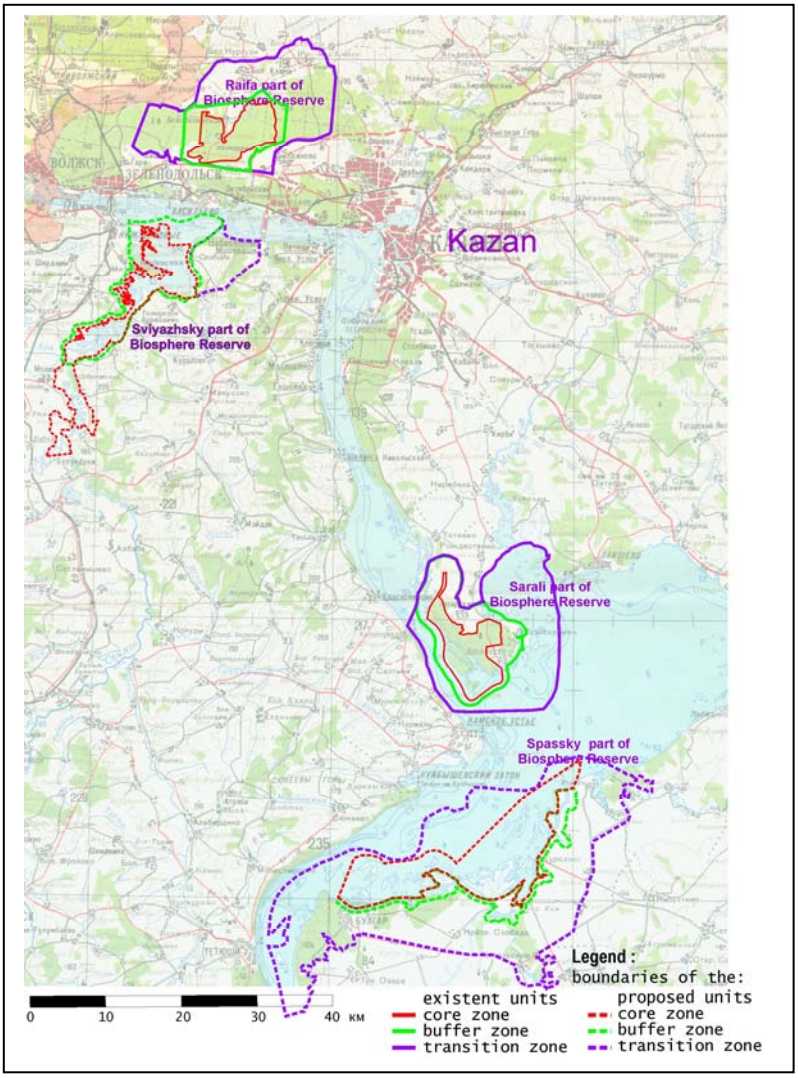

Figure-1. The scheme of the Great Volzhsko-Kamsky Biosphere Reserve.

Sviyazhsky unit is comprised by valley and fresh-water ecosystems of the mouth part of Sviyaga river (tributary of Volga), enriched in islands, gulfs and bypasses. It is and important center of biodiversity conservation in the region. Spassky unit includes the system of islands (64 islands) and shallowlands of Kuibishev Reservoir. It also plays an important role in reproduction of aquatic and semi-aquatic fauna. “Spasky Archipelago” was included into the List of Key Ornithological Territories of Russia (KOTR) and into the “List of objects, recommended for incorporation into the list of wetlands, protected by the Ramsar Convention”

Sviyazhsky and Spassky units are interesting objects either the nature refuges or the historical and architectural monuments of the Christian and Muslim cultures. The “Sviazhsk Island” (the place of Ivan Cruel arms for which captured Kazan in 16 century) and “Great Bolgary” (the cradle of Tatars) are founded near the boundaries of the natural refuges. We included this objects in the transition zones of the units.

As far as the Great Volzhsko-Kamsky Biosphere Reserve includes the federal and regional protected arrears it is necessary to form the Coordination Board, represented all the interested sides. More over, the “Agreement on collaboration to provide the effective development of Great Volzhsko-Kamsky Biosphere Reserve MAB UNESCO and to realize the principles of Earth Charter in Tatarstan Republic” between Ministry of Ecology and Natural Resources of Tatarstan Republic and Volzhsko-Kamsky National Nature Reserve was signed. The subject of agreement is: landscape and biological diversity conservation, establishment of approaches, aimed to provide and develop the balanced interrelations between people and nature, participation in realization of Ears principles in Tatarstan Republic.

Now, when the Sviazhsky and Spassky refuges received the status of units of the Great Volzhsko-Kamsky Biosphere Reserve we will start to prepare the project of Tatarstan Republic government resolution “About Great Volzhsko-Kamsky Biosphere Reserve”. The Coordination Board, including the representatives of the government, biasness structures, NGO and the specialists of protected arrears will examine and maintain the plans of the demonstration projects, promote the fundraising and control its realization. The executive committee, including the working groups, which are responsible for projects realization will be organized under the Coordination Board guidance.

Conclusions from Thematic Issue – III
How does the zonation of a biosphere reserve contribute to sustainable development?

Zbigniew NIEWIADOMSKY

Moderator

Challenge: Evolution of the BR concept

- As mentioned in the opening session by the MAB Secretary, Mr. Natarajan ISHWARAN and the perception of biosphere reserves (BRs), Name "Biosphere RESERVE" often resulting in confusion and causing negative perception of BRs among the local stakeholders.

- Question: Shall we use a different name, such as "biosphere areas", or better explain the meaning and keep the name?

- Suggestion: keep "BR" name at the international level, but allow more flexible translations / interpretations into other languages, at the national level.

The zonation concept

- as the added value and identity of biosphere reserves

The zonation

- reflects intensity of human interventions
- allows for comparative analysis of zones under various human pressure (where the core zone is the "point of reference")
- translates the challenges corresponding to the three BR functions into space.

Simultaneously, the BR zonation;

- is a tool, not a constraint, and not an objective *per se*.
- is a tool to visualise not only the functions but also the values of the area,
- is a tool helping to prioritise and design actions for protection and/or sustainable development of the BR area.

The BR zonation versus national legislation and governance structure. The design of BR zonation and its governance is most often influenced by:

- the original driving force/s for BR establishment (central authority or local initiative),
- the land ownership structure and the land management rights.

BR legislation

- Question: Is a specific legislation needed for BRs or is it better to build the BR on existing legislation and structures?

- Official recognition permits budget and staff, which the label only does not.

- Suggestion: a study on existing legislations on biosphere reserves should be undertaken.

Lessons learnt and sharing of experience

- on zonation and land management in different contexts for reaching sustainable development

Participatory approach to designing the BR zones

- Designing BR functional zonation can be a tool for negotiation on objectives and land use planning among stakeholders.

Interpreting the BR zonation scheme

- for sustainable development in different settings

Interpreting the BR zonation

- should be made in parallel with **communicating potential benefits** of the BR to the local stakeholders.
- **Synergies** between conservation of natural and landscape values, ecosystem services, employment opportunities and sustainable local development
- should be explored in each local setting,
- better explained and clearly communicated to local stakeholders,
- thus providing for the **local support for the BR, and for local involvement in BR activities**.

However, BR personnel often lack communication skills. Moreover, the methodology for assessment of the BR ecosystem services and the economic value of each BR zone still needs to be developed, to be communicated and easily understood by the local communities.

BR zonation flexibility and response to changes

Questions:

- How can the dynamics of socio-ecological systems and changes over time and space be taken into account?
- Are there mechanisms needed to revise the zonation?
- Is the periodic review process the right tool?

Suggestions:
- Monitor and accommodate changes, especially in view of global changes.
- Monitor the relevance of the current BR zonation and effectiveness of management policy / management plans for BRs, which may justify revision of the zonation.
- Use the periodic review to adjust / update / upgrade zonation of the BR on the regular basis,
- but react immediately to changes and emerging threats by adjusting zonation when necessary, also between the periodic reviews.
- Potentially include the assessment of ecosystem services and the economic value of each zone of the BR into the periodic review.

Proposals for innovative land management practices and approaches to be tested

1. "Theme Areas"
- in addition / parallel to BR zones,
- communicating the values and involving landowners,
- focused on the main values of particular areas (as identified by the local stakeholders),
- becoming sites of projects combining all BR 3 functions.
- (learnt from the case study on Kristianstads Vattenriket BR)

2. External BR border (transition zone border) equal to municipality administrative borders
- Including the whole municipalities / communities into the BR (e.g. into its transition zone)
- which creates better "sense of ownership and responsibility for the BR",
- better logistic support for the BR operations, and facilitates data collection / improves data availability.
- (learnt from the case study on Kristianstads Vattenriket BR)

3. Including entire river basins / water catchment areas into the BR
- (e.g. into BRs transition area).

Recommendations for the EuroMAB Action Plan:

A- Role of EuroMAB in building capacities of its members

1. Organisation of ***training sessions*** on the methodology to establish or revise the zonation, based on the ARDI methodology (*the French MAB Committee has developed a methodology called ARDI = Actors,Resources, Dynamics and Interaction, and is proposing to organise training sessions in France within the frame of EuroMAB).*

2. Using the web platform created by the MAB Secretariat in Paris for ***experience exchange*** among the EuroMAB members targeted on:

- compilation of information on zonation patterns implemented in particular BRs/countries,
- including lessons learned and difficulties,
- to be prepared or at least started before Madrid
- and compiled by the MaB Secretariat in Paris;
- on communication and negotiation techniques,
- inside and outside biosphere reserves,
- allowing better interpretation of the BR zonation
- and communicating potential benefits of the BR to the local stakeholders;
- on methodology for evaluation of the relevance and effectiveness of the BR zonation, for inclusion into the periodic review,
- and revision of zonation where appropriate (indicators to be developed for the periodic review),
- as well as valuation of the BR effect on local sustainable development.

B- Potential contributions of the EuroMAB Network to Madrid BR Congress

- Idea: contribution of the different BR zones to ecosystem services, to be taken into consideration within the periodic review process.
- Development of a specific methodology to harmonise zonation in transboundary BRs.
- Developing a study on existing legislations on BRs, targeted at decision makers, and providing sound guidance to Governments (similarly to commonly approved and implemented IUCN protected area categories).

Thematic Issue – IV

How to better reach and capture the economic and social benefits of biosphere reserves?

Background

Creating and managing a biosphere reserve is a tool for reaching sustainable development, through testing innovative practices and approaches and sharing them to the broader landscape. How are the biosphere reserves in the EuroMAB Network used for innovative research, for implementing sustainability programmes, for demonstration activities and capacity building enhancing the role for ecosystems good and services in development?

Key Issues

1. What are (innovative) ways and success factors for providing economies to local people?
2. What are the social/ economic benefits? How do you measure / assess that the biosphere reserve experience/idea has been incorporated into policies and land management?
3. Which approaches or indicators have been proven as being the most useful (e.g. depending on costs or data availability)?
4. How to measure the success of labels, charter, sustainable communities?
5. How to implement processes and mechanisms which value these benefits?
6. What are the linkages with the tools developed in MEA?
7. How is science/results of scientific research helping along in this process?
8. Can you assess the relevance of science/ research results to achieve greater sustainability? Are there examples? What are the processes that helped this transfer of knowledge? How do you promote dialogue between researchers, planners, policy makers, citizens and other stakeholders to improve the integration of research outcomes into planning and management of the biosphere reserve and make activities and results visible in society?
9. What is your experience of sustainable local development, including tourism: in what way does local development, including tourism match with the biosphere reserve's ideal of a "sustainable development"? And what are in your case the problems for not matching reality with the idea? Are there solutions?
10. Is the biosphere reserve testing new approaches of new economic incentives? Is it used for this function and supported in this function by your government? What could be helpful in order to strengthen this role?
11. How can biosphere reserves build partnerships with governments, the private sector to form new economic incentives for landscape stewardships? What actions are taken for increasing its impact and visibility?
12. Can you describe a partnership project that you have initiated in the site, and that was replicated elsewhere?

Expected Outputs

- Building a clearing house on tools and methodology for measuring benefits in BR's, grid analysis to analyze sustainable projects (i.e Cévennes BR, Canada BR's…), partnerships projects;

- Designing a programme on better linking biosphere reserves with work of the Millenium Ecosystem Assessment (payment for ecosystem services, range of incentives types in biosphere reserves for stakeholders…);

- Seek possibilities for building partnerships with the European Environmental Agency monitoring programme for environmental and socio-economic indicators, with the European Commission statistics on socio-economic benefits and sustainable development;

- Concrete recommendations for EuroMAB cooperative programmes (Interregional programmes to develop economies and further demonstration of benefits of biosphere reserves, EU funding);

- EuroMAB contribution to the Task force on quality economies for the World Network of Biosphere Reserves.

References

Policy paper Madrid, SC- (available end of September)
Quality economies task force http://www.unesco.org/mab/BRs/Qe.shtml
Millenium Ecosystem Assessment reports
http://www.millenniumassessment.org/en/Synthesis.aspx

Keynote Speaker: Nicholas BONDIL, How to better reach and capture the economic and social benefits of biosphere reserves?

Moderator: Doris POKORNY

UNESCO Secretariat: Maria PRCHALOVA and Philippe PYPAERT

Presentations:
Ulrich GEHRLEIN, Implementing Strategies for a Sustainable Economy in Biosphere Reserves

Petr CUPA, Case study: Development of sustainable tourism in Soutok area

Ken REYNA and Nicolas BONDIL, Economic valorisation and uses of nature in mount Ventoux BR Constructing an identity with the contribution of anthropology

Doris POKORNY, Jobs and the Biosphere? Socio-economic benefits of sustainable economies in the Rhön biosphere reserve, Germany

Engelbert ROUSS, Task Force Quality Economy - How to capitalize beauty and quality

Implementing Strategies for a Sustainable Economy in Biosphere Reserves: Considering the Socio-economic Requirements

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1. Overall Aim and Approach

The R&D project "Strategies for a sustainable economy in biosphere reserves" aims at the development and implementation of suitable strategies which can serve as the basis of measures. They are intended to provide a standard for sustainable economy in biosphere reserves and in the regions in which the BRs are included. These measures can be implemented by members of the biosphere reserve management as well as other regional actors – e.g. business development units.

The research project, which is running over a period of three years, includes a preliminary phase for the analysis of the socio-economic situation of biosphere reserves in Germany and the development of strategy approaches. The main phase model trial-tests strategies and develops first projects in two biosphere reserves.

1.1 Preliminary Phase

The preliminary phase emphasises on a socio-economic regional analysis of the biosphere reserves. The development in these areas was examined against the background of the developments at federal state level and national level. Moreover, comparisons were made with surrounding regions as well as between biosphere reserves. On the basis of these socio economic parameters, profiles of strengths and weaknesses were derived which are related to the individual biosphere reserves.
The main steps of the socio-economic regional analysis are (see Fig. 1):

- **A1 Development of a socio-economic Indicator-Model**
- **A2 Data-Collection**
- **A3 Development of the Database and Data Entry**
- **A4 Data-Analysis and Appraisal**

Furthermore, the research project regards the institutional embeddedness and the linkages of biosphere reserves management to the regional environment, especially concerning economic issues. The regional setting was examined by the following agenda:

- **B1 Survey of the institutional Setting**
- **B2 Survey of regional Strategy Approaches**
- **B3 Survey of the regional Project-Portfolios concerning Sustainable Economy**
- **B4 Analysis an Appraisal of the Results**

Results were being used to support an analysis of potentials which is intended to provide the point of departure for strategy proposals regarding the promotion of a sustainable economy in biosphere reserves. The following two steps were intended:

- **C1 Potential Analysis**
- **C2 Outline of Strategy Proposals for different Types or Groups of Biosphere Reserves in Germany**

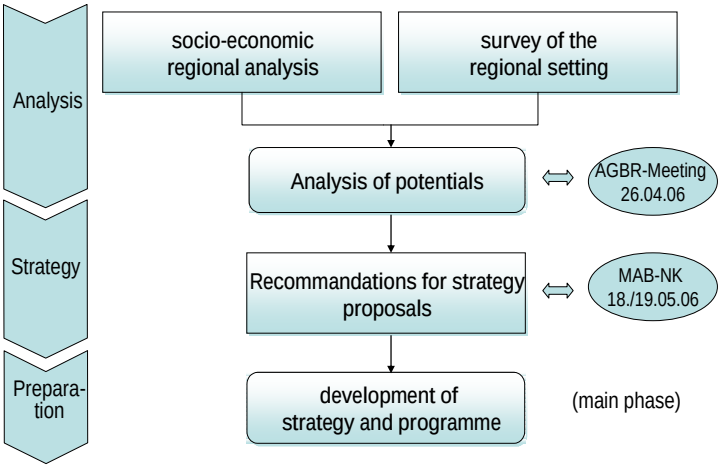

Figure-1. Working-steps of the preliminary phase of the study *(Source: author)*

1.2. Main Phase

The main phase – which is running at the moment – focuses on the development and implementation of model strategies for a sustainable economy. In two biosphere reserves, regional important and economic promising themes will be elaborated in an internal strategy process. Afterwards, the BR-administrations will ask regional actors to take part in a regional strategy process, elaborate a common strategy, and implement first projects. One of the main goals of the strategies is to add value to local products by strengthening regional value-added chains.

2. Undertaken Analyses and their Results

2.1. Socio-economic Regional Analysis

Analysing the socio-economic situation of biosphere reserves, to find promising strategy approaches the territorial scale of the examined region has to be bigger as the existing BR itself. Especially the economic and social independence, in which the BR is embedded, has to be considered. In the study, these areas are referred to as BR-Regions. For reasons of data availibility and in regard to county administrations, the BR-Regions were defined as the common area of all the counties which are overlapping one biosphere reserve. With regard to the existing administration units for biosphere reserves in Germany, 17 BR-regions were defined.[1]

The database designed for the socio-economic regional analysis allows to sample primary data and to define several calculations for creating comparable figures and indicators. The socio-economic consists of eight categories:

- Spatial structure, infrastructure and adequate supply
- Demographic aspects
- Economic power
- Economic structure
- Employment market
- Entrepreuneurial initiative
- Agricultural structure
- Tourism

Out of 140 parameters 54 indicator were defined to describe the development and situation in these categories. For each of the 17 BR-regions indicator-profiles were generated. Short profiles contain a statistical comparison with different administration levels in Germany. Out of the 54 indicators the most significant indicator per category was defined as a headline indicator. The following indicators were defined as headline indicators (Table-1). In the next step, the BR-Regions should have been clustered into groups with equal indicator values. But soon the staff had come to the conclusion that there are no specific clusters to create because the indicator values differed too much.

As a consequence of the big variety of the socio-economic basic conditions, in the different BR-Regions 17 individual SWOT-Analyses (*S*trengths, *W*eaknesses, *O*pportunities, *T*hreats) were elaborated. These SWOT-Analyses serve as a

[1] There are just 13 BRs in Germany. If one BR lies in two federal states it has two different administrations – one for each federal state.

starting point for elaborating specific approaches that serve as strategies for a sustainable economy.

Table-1. Main categories and headline-indicators of the regional analysis *(source: author)*

Spatial structure, infrastructure and adaquate supply	spatial structure
Demographic Aspects	population development (1995-2003, in percent)
Economic power	development of the gross added value per employee (1996-2003, in percent)
Economic structure	development of the employee liable for social insurance (1996-2003, in percent)
Employment market	proportion of school leavers with higher school graduation (2003)
Entrepreuneurial initiatve	sevelopment of buisness-registration and -deregistration per 1000 habitants (1996-2003, in percent)
Agricultural structure	development of the employees in the primary sector (Agriculture, forestry and Fishery) (1999-2003, in percent)
Tourism	overnight stays per 1000 habitants (2003)

2.2. Regional Setting

Examining the regional settings, the study looked at institutional structures, existing strategy proposals, and existing regional development projects promoting a sustainable economy. A questionnaire survey examined especially the relation between the BR administrations and business development units of the county administrations as well as the main focus of their work. Furthermore, on the survey examined regional development initiatives, development concepts, networks, and projects concerning the development of a sustainable economy.

Which were the current topics of cooperation between the BR-Administrations and the business development units? The most mentioned topics are tourism, regional marketing, and marketing of regional products. Both groups mentioned encouragement of regional craftsmen and enterprises, the promotion of renewable energy, the development of regional value-added chains, and the marketing of regional products as favoured future topics of cooperation.

Another finding of the survey is the spatial overlapping of different regional development initiatives and also of protected areas like nature parks, national parks, and LEADER-Regions. In consequence, there were about 80 development concepts and other strategic proposals in the 17 BR-regions. Moreover, the search for existing regional networks and projects found 148 cooperations and 394 projects with different scopes concerning the regional development.

2.3. Conclusions from the Analyses undertaken

The socio-economic situation and development of the examined 17 BR-Regions in Germany are very heterogenous. That demands individual assessments of the collected data in terms of identifying strengths and weaknesses as well as opportunities and threats. Because of the relatively large scaled areas there is also a demand for examining inner-regional disparities.

The elaborated results are representing good starting points for the development of individual regional strategic approaches for a sustainable economy. Meaningful strategic approaches could be:

- Use of endogenous potentials
- Intensifying the relation and trade between rural regions and urban areas
- Developing new services in rural regions
- Developing new regional quality-products
- Encouraging and managing economic clusters and networks
- Promoting of cooperations between enterprises and small initiatives
- Developing and strengthening regional value-added chains
- Encouraging craftsmen and enterprises
- Intensifying the exchange of knowledge and information
- Encouraging business start-ups
- Initiating staff-development-strategies for enterprises
- Qualifying of products, offers and services
- Developing regional and renewable energies
- Developing sustainable tourism

In addition to these topic-focused strategies, the undertaken survey also implicates the need for improving the coordination of particular regional initiatives, which are working in the same field. Especially, the administrations of BR there are in the need of cooperation and coordination in order to carry out strategies for a sustainable economy. This means an intensive coordination of regional action in specific fields through the management of regional cooperation. a common understanding of the economic region, of the regional marketing, and the target markets and target groups.

3. Final Recommendations

The results and conclusions of the study can be summerized in the following thesises:

1. The Analysis-Instruments:

- The socio-economic indicators used as well as the database elaborated are suitable for socio-economic monitoring of biosphere reserves and their surrounding regions.
- The indicators used for the evaluation of socio-economic effects of BRs and their strategies for a sustainable economy serve as baseline-indicators as well as outcome-indicators.
- The socio-economic analysis in combination with the survey of the regional setting is also suitable to elaborate SWOT-Analyses as a starting point and to elaborate specific strategies for sustainable economic development.

2. Biosphere Reserves and Sustainable Economy:

- The implementation of strategies for a sustainable economy needs an area which is bigger than the BRs are now. The BR and its surrounding area could be called a BR-Region.
- The size of BR-Regions should consider the economic and social independences and cycles in which the BR is embedded.
- A variety of corresponding enterprises is needed for developing regional value-added chains and intensifying the regional cooperation between regional enterprises.
- Channels of sales and purchases of the located enterprises and traditional economic, cultural and administrative relations are defining the economic area as well as the BR-Region.

3. Recommendations for the Implementation of Strategies for a Sustainable Economy:

Because of the need of individual regional strategies for a sustainable economy, the following recommendations for the implementation of the strategies should be considered:

A. Strategic Objectives:

A.1 Occupancy of future regional Action Fields through:

- Enlargement of the professional competences of the BR-administration
- Take on responsibility for duties of business development
- Developing projects and acquisition of financial resources

A.2 Establishing the BR-Administration as a regional „Sustainability-Driver“through:

- Initialysing a region-wide consultation-process
- Providing a permanent cooperation-platform
- Implementing a regional change-management

B Strategic Approach:

B.1 Step One: Internal Strategy- and Programme-Development in the BR

- Detailed analysis of the situation, the development, and the regional actors
- Clearing of the self-conception/image and the role of the BR (mission statement)
- Competence-profile and organisational development
- Need for qualification and coaching of the staff
- Elaboration of a strategy and program for initialising sustainable economy in the region

B.2 Step Two: Access for a regional Strategy Process „Sustainable Economy“

- Clearing competences and roles between BR-administration and regional actors
- Defining the BR-region / economic area
- Defining the main action-fields of sustainable economy

B.3 Step Three: Agreement on and cooperative Implementation of the Regional Strategy for Sustainable Economy

- Defining and implementing projects for a sustainable economy
- Implementing a permanent regional cooperation-platform
- Regional process- and change-management

4. Reference

Gehrlein, Ulrich et al. 2007**.** Strategien zur Förderung des nachhaltigen Wirtschaftens in Biosphärenreservaten, Bonn-Bad Godesberg

Case study: Development of sustainable tourism in Soutok area

Petr Cupa

Lower Morava Biosphere Reserve

Czech Republic

Lower Morava Biosphere Reserve, the youngest of six Czech biosphere reserves, was approved in 2003. The area, covering over 350 km^2, is situated in the south-east corner of the Czech Republic. The whole region has been formed by human activity for centuries and every remnant of the scarce original habitat is valuable. Today's population of over 20 000 people living within the biosphere reserve is mainly engaged in agriculture, small-scale industry and tourism, since the area attracts well-deserved attention of public. The reserve is administered by the **Lower Morava Biosphere Reserve, Public Benefit Corporation.** It is for the very first time in the Czech Republic´s history that a biosphere reserve is managed by a non-governmental organization, as the rest of the Czech biosphere reserves are linked to official government protected areas and share the management.

The southernmost part of the biosphere reserve called Soutok (which means confluence in Czech) is known for its unique flood plain forest and meadows. Due to its close vicinity to the state border with Austria, the access and farming in the area at the confluence of Morava and Dyje rivers, was until 1989 severely restricted. Following the fall of the Iron Curtain the area has become accessible to visitors whose numbers are increasing every year. This area of unique natural and cultural value is not only part of the biosphere reserve, it is also partially included in the Lednice-Valtice Cultural Landscape World Heritage Site. It houses two National Nature Reserves, Special Protection Area for birds and Special Area of Conservation, which are proposed parts of the Natura 2000 network. At the present, the largest game preserve in the Czech Republic can be found in the area of Soutok, which also houses several critically or severely endangered species.

Owing to the attractiveness of the area, its destruction by unorganized tourism and development of environmentally damaging economic activity is imminent. Thus it was deemed necessary to discuss and define the possibilities and limits of further developments – most importantly from the point of view of tourism development. Consequently, our BR in co-operation with the South Moravian Regional Development Agency came in 2005 with the project Development of sustainable tourism in Soutok area, which main objective was to prevent a possible degradation of the high potential and value of the area by establishing mutually

agreed rules and limits for further development of tourism and other connected activities in the area. The project was focused on defining possible forms of a suitable, environmentally-friendly and sustainable use of the given area, on supporting communication between subjects functioning in the area, on preparing conditions for discussions about nature protection of sites proposed as parts of the Natura 2000 network and on initiating cross - border discussion on land use (including indirect impacts) and the boundary river use.

The strategy project came into life as a result of agreement between representatives of the general public, business and non-profit spheres. The project was also consulted by representatives of Austrian municipalities and non-profit organizations located in the vicinity of the Soutok.

The key success factor of the project was the communication. The strategy making process was initiated by BR together with the local municipalities and the entrepreneurs on one side and the conservation authorities with scientists on the other, as both sides realized the environmental and consequently economic potential of the area and the view of the development was totally different. They turned to BR with the request to accommodate a debate on the future of the area. Therefore BR acted as a project coordinator and a panel, where the key subjects of the area, such as important land and property owners, local authorities, entrepreneurs, foresters, farmers, state institutions, non-governmental organizations and various stakeholders tried to find consensus through moderated discussion. BR as an independent mediator - this might be one of the less tangible, but very important, social benefits provided by BRs to local communities.

While preparing the proposal of strategy of sustainable tourism, the main criteria for any part included was the feasibility. Feasibility from the financial point of view and conservation point of view as well. The Lower Morava BR safeguarded the process so it jeopardized neither the environment, nor the interests, of individual forest land owners. The discussion of all participants led to the inception of nine project plans (Visitor Trails, Visitor Center, Visitor Programs, Observation Posts, Archeological Open Air Museum and Light Fortification Museum, Forest Park in town of Breclav, Ecological Tourist Transport – eco-train, Tourist Water Transport, Czech-Austrian Tourist Foot Bridge). Each project aimed to drive the tourist pressure off the sensitive areas, providing worthy alternative, utilizing existing facilities and creating potential for new ones with new jobs in the future. The initial strategy was finished in 2006 and the first of the project plans are already in progress (Visitor trails, Wildlife observation posts, Visitor center and Forest parks in the town of Breclav). The tangible outcome in number of created jobs will be assessed after finishing each project.

The whole strategy making project was composed from the very beginning to meet the EU funding criteria. The key factor of EU funding is co-financing. This is the point where BR can build partnerships with authorities, the private sector and other stakeholders. Most of the entrepreneurs of any given area are seeking better public-relation. BRs should offer them PR improvement through the adequate beneficial projects. Co-financing of sustainable development projects is a sensible way to pay for landscape stewardship. The concept of Biosphere Reserves is very diverse, and the project potential is thanks to the presence of human aspect much larger than in regular Nature conservation reserves. Conceptional and financial partnerships can benefit the environment, local communities, make BR´s ideals and activities more visible in public and wisely use philanthrophical opportunities provided by the private sector and all the above at the same time. The Strategy was funded in part by the European Union under the INTERREG III.A initiative as well as by Lower Morava BR, Forests of the Czech Republic, state enterprise, and the town of Břeclav. The pilot projects are designed to be financed from EU Operational Programs. EU funding presents important economic incentive and benefit to any area, not only BRs. Since no project is completely finished yet it is difficult to put a price tag on the job our BR have done steering the available funds to BR communities. However the estimate is running in the neighborhood of 2 million Euros in project money.

Even with the incentives EU provides, BRs cannot wait to be invited by authorities to take part in greater land management, planning and policy making. BR managers must take active part in the processes, enriching them with the ideals the MAB program stands for. If they succeed, the fund holders will realize their usefulness and the financial benefits provided through realization of such plans will eventually come along.

An unquestionably positive outcome was the fact that each involved group was interested in finding a collective solution. All the parties concerned appreciated, under BR leadership, both the project and the ensuing partnership, and agreed to implement the proposed pilot projects designed to enhance the region's sustainable development in the future. The project is still ongoing.

What are the lessons we have learned from the project? We have learned that there were two success factors: an open communication with BR acting as an independent mediator and financial incentives conditioned by obeying sustainable development rules. The social/economic benefits gained during the project included: the number or areas of saved nature sensitive locations, the number of new jobs engaged in sustainable development projects and the amount of money raised to enhance sustainable development.

How did we achieve that the BR experience has been incorporated into local policies and land management? We didn´t wait to be invited by authorities to the planning meetings. Our BR initiated creation of land management strategy and planning and the stakeholders/authorities took BR ideals into consideration. We proved that the most effective approach is if BR initiates a problem solving process and than acts as an independent mediator to the discussion of concerned parties. Advantages are the low cost for BR, overseeing and advising opportunity throughout the process and since involved parties are the ones to agree on the solutions, it brings along greater feasibility of outcomes in compare to arbitral decisions.

How the science helped along in this project realization process? The research in this case revealed the potential danger for the area presented by unorganized tourism and development. The problem of almost every scientific research is the transfer of the message to the uninitiated public. The role of BR should be in translation of the science into plain language and consequential explanation of potential benefits to local communities. For example: if you – local people – will use the forest a more sustainable way, there will be more birds living in it and there might be more bird watchers coming to your area to see it, wanting to spend more time in your area, demanding more services, guiding.

In order to improve dialogue between researchers, planners, policy makers, citizens and other stakeholders we invite all of them to project proposals, including them in the BR management as well. In case of Lower Morava the founders of the Public Benefit Corporation came from a wide spectrum of society. The managing body - the board of directors - consists of representatives of local businesses, agriculture and industry, together with the Ministry of the Environment and the largest nature conservation non-governmental organization in the Czech Republic. We also have the representatives of the three regions that BR incorporates. The board of directors has also a scientific board to help. If asked, the twelve member scientific board would provide relevant information to ensure conditions for responsible decision making. Just recently we have experienced that science is being used by some individuals to pursue their own agenda. They attract the public attention and subsequently the grant money by using media to spread their biased and sometime even questionable scientific research results. Unfortunately they use any means available even at the cost of biosphere reserve. It is duty of every BR management to cooperate only with reputable scientists and to provide to the public and authorities only results of unbiased strictly scientific research in order to ease their decision making.

As I indicated earlier we do not test any new economic incentives, however we try to utilize to the most already existing ones. The key role plays EU funding in combination with sponsoring from the private sector and money earned from own

services. The government with its incentives is helpful but not as much as it could be. In order to build partnerships with governments, and the private sector to form new economic incentives for landscape stewardships we included all involved parties from the very beginning in the creation of the projects, lead the process, accommodated the communication, mediated the discussion and convinced all concerned using the scientific facts, that the project and the partnership is beneficial and as such worth investing some money.

In the course of the project we have learned how important is to share our experience with others. After finishing a project and during the process we presented the project and the main outcomes in media. The positive PR aimed at general public is vital. Unfortunately, today's media are catastrophe oriented and it is difficult to present a project that is beneficial to the people and nature. From media point of view the topic is not interesting. I would welcome an informal forum within the MAB network, a web site accessible by BR only, which would enable us to share practical tips and any good ideas how to approach the public through media on the topic of sustainable development and share experience with related projects.

Economic valorisation and uses of nature in mount Ventoux BR Constructing an identity with the contribution of anthropology

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1. Mount Ventoux BR

Mount Ventoux biosphere reserve is located in south of France. The BR, created in 1990, is put under the authority of a public structure. It involves local mayors and local authorities. It covers 900 km2 and gathers 34 villages and 35 000 inhabitants. The global aim of this structure is land management, economic development and environment.

From an ecological point of view, the mountain hosts a great floristic and faunistic wealth. Its intermediate position between the Mediterranean area to the south and the Alps massif to the north combined to traditional activities (agriculture, forestry) have helped to shape a wide variety of landscape and ecosystems.

From an economic point of view, agriculture is the first resource. Vineyards, arboriculture, crops, lavender, sheep breeding are the major activities. So far, these types of products have maintained a stable local economy. But, international competition has led to an economic crisis. So, what will the impact be on employment? How can we maintain landscape quality with a decreasing number of farmers? Further more, landscape quality is a factor of growth and attractiveness. With in addition growing urban pressure, what will the impact be on the second economic resource: tourism which generates financial flows estimated at 100 Millions Euros per year. 1 500 employs depend on this industry.

2. Genealogy of the project

In general, given the context of agriculture crisis, there is an increasing trend towards more and more signs of quality for the products in the environmental problematic. It implies a large scale of procedures, supplementary costs, segmented way of valorisation, and sometimes for a small benefit. In this sense, on the Mount Ventoux BR, some farmers came to ask if they could use the logo of UNESCO and BR words. It started with three wine cooperatives. It was ten years ago. Studies were made to think about the possibility of a BR label and to answer to juridical complexity due to French context.

French MAB Committee launched a national analysis in each BR and wanted to develop a new kind of approach. The idea of a Charter started. The purpose was to work in priority on the identity of the territory. At the same time, it was a mutual willingness to promote actions done for sustainable development in the BR. Last but not least, to rise a collective group on the territory and to correct individual logics, it is promoting and marketing under a single identity. In fact, on this new perspective, the issue we were facing for economic valorisation for the BR consisted in shifting from short term financial and individual profit to long term benefits for the population and its land

3. The contribution of social sciences

More and more, land management through MAB program involves natural sciences and social sciences. The fundamental purpose of the charter –which is a territorial approach- is to make a shared identity for the Biosphere reserve emerge. This is why scientific expertise in social sciences may be mobilised. Anthropology can help BR coordinators for a better appropriation of BR philosophy by local actors. In other terms, analysing scientifically uses of nature and collaborating in the implementation on the environmental policies.

4. How to proceed to shape the identity of the BR?

The guideline is to think about the very long term of our territory to reach the common values. Theses values are inherited from the social history of the place and from the uses of territory.

Three federative values were identified during the investigation. First of all, the diversity of landscapes and way of life frequently emerged. The interviews highlighted the differences on the territory: differences of climate and consequently of environment more generally, (different uses of nature). This, combined with history, leads sometimes to incomprehension between communities instead of a positive diversity. There is a natural frontier between the north side and the south side of the country. For example, local language is affected by that frontier and the families of different sides started to get married only this century. However, the federative image of the mountain is really strong. Then, comes the attachment to land itself. The idea of keeping control on your own territory is directly linked with the contemporaneous problem like urbanization and rising in real estate prices, like pollution or immigration. And finally we can raise the importance of local knowledge with traditional land uses, traditional handcraft, family structures.

This analysis is based on 40 interviews. Generally, the interviews were doubled sided. The stake was to go beyond the negotiation on the charter organisation. That is to say for instance to bridge the gap of the questions like how can we communicate on the BR? What will be the structure in charge of the charter?

The important point was to talk about the evolution of the Mount Ventoux countryside. This kind of discourses reveals the real engagement of the persons for their place. Let's illustrate this point by an interview. With a local agricultural authority, the talks began on the register of negotiations. The acceptation of the charter was linked to a quick financial profit. But then, the discussion came to the critic of supermarkets networks and the negative economic impact on local productions. How was it possible that its product, based on an ancient local knowledge, was considered as a basic common product?

In conclusion, after this kind of considerations, the next step is indeed to implement the charter and gather the resources in order to create this collective action. The key point is the energy involved in the idea because the methodology is participative. And consequently, the technical and organisational part has to be created by actors of the project. Some proposals were made during the phase of discovering Ventoux's social dynamic. The hypothesis for the future is that financial and technical resources necessary for the viability of the charter will come if there is a meeting on values and identity.

Jobs and the Biosphere?
Socio-economic benefits of sustainable economies in the Rhön biosphere reserve, Germany

Dr. Doris POKORNY
Rhön Biosphere Reserve

and

Sabine NATTERMANN

The following article is based on the findings of a diploma thesis at the University of Tübingen (Chair of environmental management), which was carried out by Sabine Nattermann (NATTERMANN 2006) in the Rhön biosphere reserve in cooperation with the Bavarian administration unit of the Rhön biosphere reserve.

1. Introduction to the Rhön biosphere reserve

The Rhön is situated in the centre of Germany, 150 km east of Frankfurt and was designated by UNESCO as a biosphere reserve in 1991. It is one of Germany's 13 biosphere reserves and covers an area of 1.850 km².

The Rhön is considered a rural area with a total population of 162.000 (in 2004) who live in numerous small villages (see Photo-1) and towns in 42 municipalities. The area covers five districts within three federal states or "Länder": Bayern (Bavaria), Hessen and Thüringen (Thuringia) (see Figure-1).

Photo - 1. Typical rural settlement © *photo Vogel*

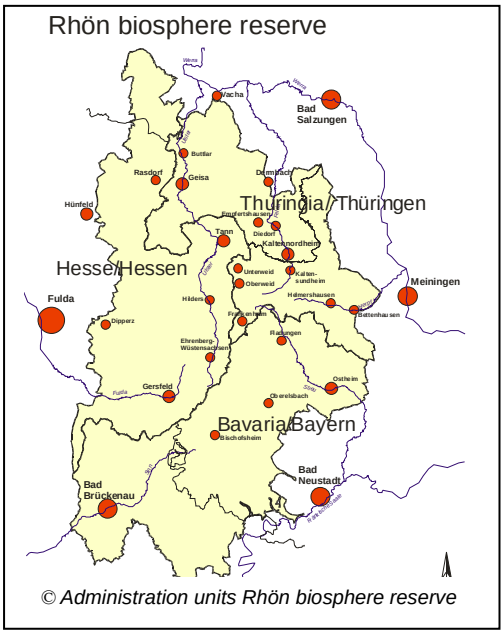

Figure-1. Administration units in Rhön Biosphere Reserve

Managed forests cover 40% of the area. 35% is grassland (both pasture and meadows including bogs and other landscape features), 18% is arable land and 7% is taken up by settlements, roads or other infrastructure. Due to the harsh climate and the poor soils, large parts of the Rhön can be regarded as marginal agricultural areas. The region can be characterised as a rural area with small and medium sized enterprises, a relatively weak economy and high levels of out-migration especially of highly educated/ well trained young people in search for work opportunities, elsewhere.

Generally speaking, the task of the biosphere reserve is to foster sustainable regional development, focussing especially on the primary sector and on food-processing crafts, together with the tourism sector. As an intended side effect this is the basis for the conservation of the cultural landscape, with its abiotic resources and biodiversity (including agro-biodiversity). The success or failure of the Rhön biosphere reserve depends on the local people, especially in the private sector, on their commitment, creativity and their willingness to try out new things. It is up to them to decide on their own sustainable future, on their business goals and to take action, responsibility and economic risks accordingly. In essence the Rhön biosphere reserve tries to achieve "sustainable economies" ensuring the best possible reconciliation of economic interests, environmental protection and socio-cultural development.

2. Research questions and methods for sustainable economies

The main questions to be examined in the following are:

- Are sustainable economies in the Rhön biosphere reserve profitable?
- Do sustainable economic strategies have an advantage for enterprises?
- Which role does the designation of the Rhön as a biosphere reserve play for enterprises?

It is difficult to obtain valid data for the **assessment of the benefits and success of the biosphere reserve**, because the statistical background material available only refers to the district and state level but not to municipalities or the biosphere reserve area. Sustainable economies are related to a micro-economic sector and are thus not covered by national/ regional statistics - or if they are, they are often not available because of data protection.

As a methodological approach a field study (Nattermann 2006) was carried out with an empirical survey on the basis of structured interviews amongst 51 private sector enterprises, linked to the biosphere reserve's activities. All private sector enterprises have qualified for the Rhön regional quality label – a label which is provided to businesses which are in a broad sense committed to sustainable economies.

The following research findings will focus on the economic aspect of **value added (turn over)** and on the social aspects: **labour market (number of work places)**. These basic indicators are regarded as the backbone for describing sustainable economies.

3. Sustainable economies in the Rhön Biosphere Reserve

3.1 Profile of the enterprises and their motives for sustainable economies

Despite of the economic and structural weaknesses, the Rhön biosphere reserve has developed a strong profile on regional development in the past years. Important in this context are the re-establishment of regional economic circuits and a chain of economic added value, good marketing structures and comprehensive networking of local/ regional actors and institutions, both vertically and horizontally. About 10% of the agricultural land is under controlled organic production. The Rhön Biosphere Reserve quality label (see Table-1) is being used by 150 business partners (in 11/2007) from different sectors such as agriculture and forestry, food processing crafts (e.g. butcher shops, bakeries, breweries), crafts and industry (e.g. carpenters), gastronomy and regional (farm) shops.

All of the private sector enterprises included in the research study are small and medium sized enterprises and can be described as family owned and family run businesses. On the individual enterprise level many of the enterprises could benefit in becoming part of (new) regional economic circuits. Innovative market niches have enabled the (re)-establishment of traditional breeds and varieties (Rhön sheep, Rhön apples) in combination with new marketing options. Many enterprises also take advantage of using energy from renewable resources (e.g. wood chips) in their enterprise. Last but not the least, the Rhön quality label is a means for differentiating sustainable businesses from their competitors in the market.

Table-1. Rhön regional labels *(Source: Verwaltungsstellen Biosphaerenreservate Rhoen, 2007)*

Rhön regional quality labels for products and services:		General regional Rhön label:
		
-since 2005: regional quality label for enterprises **for conventional products and services** on the basis of regionally defined quality criteria;	-since 2005: regional quality label **for certified organic agricultural products**; on the basis of defined criteria for EU certified ecological products;	-since 2003: general regional Rhön label to make the Rhön better known and support the region and its economy; not **to be used for products or services**
-can be used on request by the private sector; precondition is the acknowledgement as a "partner enterprise of the Rhön biosphere reserve"		-can be used on request by both the private and the public sector, as well as agencies, associations etc.

The motives for the enterprises' commitment to sustainable economies are shown in Table-2. Strongest motives for them are the "feeling of belonging to the region", economic benefit in the form of "increase in turnover", their personal commitment and environmental aspects. For only a few the Rhön biosphere reserve has been a motive for directing their business towards achieving greater sustainability.

Table- 2. Motives of enterprises‘ commitment to sustainable economies (N=51, several answers were possible) (*Source: Nattermann 2006*)

What are the motives for your enterprise?	**counts**
Feeling of belonging to the region	26
Increase in turnover	20
Personal commitment	17
Environmental aspects	16
Quality aspects	7
Conservation of natural resources for the next generation	6
Committment to sustainability	5
Biosphere reserve (as an institution)	5
Customers' demand	4
Fits into the structure of the enterprise	3
Challenge to try out new approaches	2

3.2 Development of turnover

In recent years the German economy was characterised by recession and constantly increasing unemployment. When having been asked about the development of the turn over in their businesses, 20% of the Rhön enterprises (N=51) could keep and 63% of the enterprises could even increase their turnover, contrary to the commonly negative national trend in the respective economic sectors (see Figure-2). Despite the keen competition in the market, many enterprises have been able to increase their prominence.

This means that among the Rhön enterprises there is a high acceptance of sustainable economies and it is seen as a positive factor for the enterprise‘s image.

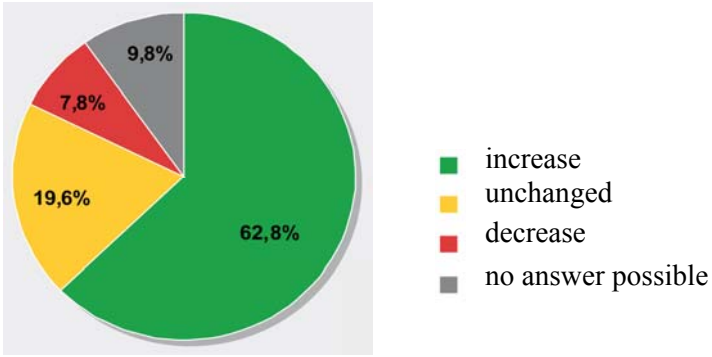

Figure- 2. Development of enterprises' turn over (N = 51)
(Source: Nattermann 2006)

3.3. Effects of the commitment to sustainability on the enterprises

Do Rhön enterprises see any positive effects of their sustainable economic strategy on the enterprise‘s profit? More than half (55%) of the enterprises feel (at least some) positive effects (see Figure-3). The enterprises from the primary sector (agriculture and forestry) have stated most effects of sustainable economy practices on their enterprise‘s profit, followed by the crafts & industry sector and food-processing crafts. Gastronomy and regional (farm) shops have stated the least effects.

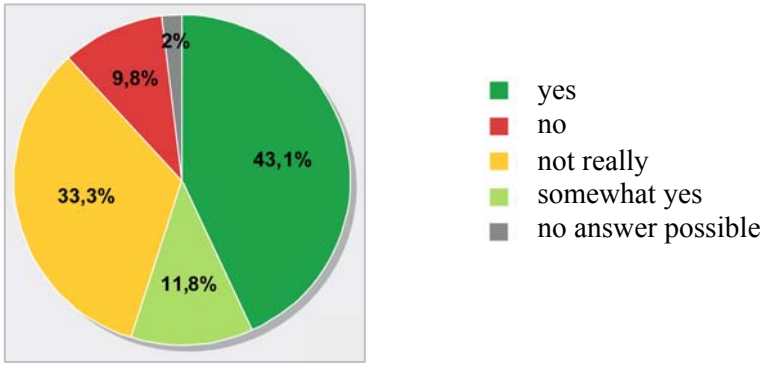

Figure- 3. Are there effects of sustainable economy on the enterprises (N = 51)?
(Source: Nattermann 2006)

When it comes to the question of the extent to which the recognition of the Rhön area as a biosphere reserve has had any influence on the economic situation of the enterprises (see Figure-4), 57% of the enterprises do not or do not really feel positive economic effects on their enterprise. This is all the more unexpected as the impetus for regional marketing and regional economies, as well as the Rhön quality label, have their origin in the biosphere reserve designation. Either the enterprises do not link their individual successes to the framework conditions in the region, or the biosphere reserve activities are not visible to them.

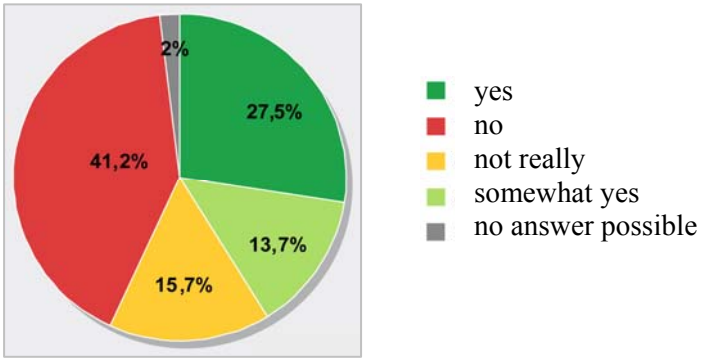

Figure-4. Does the biosphere reserve recognition have economic advantages for the enterprise? (N = 51). *(Source: Nattermann 2006)*

3.4. Effects on the labour market

When asked whether the commitment to a sustainable economic strategy has had any effects on the labour market, 33% of the enterprises confirmed a clear effect on the number of work places, and almost 12% confirmed at least some effect. With regarding to the different sectors, the effects on the labour market were most visible in the agriculture and forestry sectors, followed by food-processing crafts and crafts & industry. Least effects were confirmed by gastronomy enterprises and regional (farm) shops.

From 1991 to 2006 the direct effects on the labour market in the 51 Rhön enterprises were positive in terms of a net gain of 194 permanent work places, 2/3 of which are full time, 1/3 are part time. This constitutes a 35,5% increase in work places in this time span. When considering further projects and initiatives which have been mainly related to the public sector, including biosphere reserve administrations, a net gain of 13 permanent work places (about 1/2 full time, 1/2 part time) was achieved. This constitutes a 59% increase of permanent work places in the public sector. In addition, many short and medium term projects have brought additional employment to the region. However, most of those involved were experts from outside the region. This effect could not be assessed.

The economic trend in Germany between 1999 and 2006 was characterised by an increase in the unemployment rate at national level of 2,4%. In comparison in the Rhön biosphere there was a decrease in unemployment on the regional level reserve of 9,2%.

An increase in the number of work places (see Figure-5) could indeed be confirmed by 47% of the interviewed Rhön enterprises; in 45% the situation remained unchanged – which in itself can be regarded as very positive. Only about 8% of the enterprises had losses of work places.

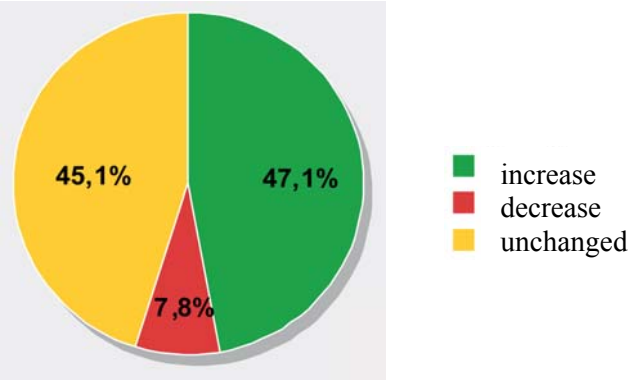

Figure-5. Development of jobs (number of work places) (N=51)
(*Source: Nattermann 2006*)

However, when being asked whether the designation of the Rhön as a biosphere reserve was a reason for this effect, 82% of the enterprises do not or do not really link these positive effects to the biosphere reserve designation.

3.5 Conclusion

The research findings show that sustainable economic approaches and activities in most of the enterprises have led to an improvement in their economic situation as well as in the regional economic situation in terms of:

- increase of turnover
- creation of work places
- strengthening of the regional economy
- providing a positive economic impetus for the rural area.

But most enterprises do not see any direct relation between their successes, the positive trends and the designation of the Rhön as a biosphere reserve. It can be assumed that among the interviewed enterprises there is a large number of enterprises, which have already in the past been committed to the principles of "sustainable economies" (without even knowing about the term), because this has always been part of their family business tradition. Therefore no changes in the enterprise policy were necessary to qualify for the Rhön quality label.

As a summary it can be stated that the Rhön biosphere reserve, as an idea and as an institution, does not have adequate visibility. Explanations for this include:

a) **"lighthouse-phenomenon“:** despite of numerous best practice projects in the Rhön biosphere reserve, those projects are still limited to market niches and have not (yet) reached a wider application. In their uniqueness they do not serve or are not being used as templates to be copied by others.

b) **"multiple institutions phenomenon":** "Success always has many fathers – whereas failure has only one". In this context, this commonly used proverb means that the direct and often indirect positive influence of "the biosphere reserve“ is often not recognised because of multiple institutions. As existing jurisdictions, whatsoever, have not changed in the region when the Rhön was designated as a biosphere reserve, the implementation of the biosphere reserve's goals is the task of many different institutions, each of which is aiming to improve its own profile and to reach and communicate successes.

Although the Rhön biosphere reserve as a state institution has been the initiator of the labelling scheme, it is not directly in charge of the operational management of the Rhön quality label. Sustainable economies are also being promoted by the region's economic department, for example. Even if recognising that sustainable effects/ activities in the region are more important than their visible institutional or thematic linkage to the Rhön as a biosphere reserve, the latter becomes increasingly important in terms of political attention and the provision of funding and staff in the long-run.

On the other hand, rather than seeing the biosphere reserve as the "motor“ for sustainable economies, the Rhön enterprises do recognise its important "catalyst" function in order to:

- increase sensibility for sustainability in the private sector
- trigger ideas
- provide and disseminate information; its organising and support function (including non-monetary)
- market and publicise ideas and success stories.

4. Lessons learned – Recommendations for biosphere reserve co-ordinators:
From this case study the following recommendations for Biosphere reserve coordinators can be made:

- improve communication and marketing of both the **idea** AND the **label "biosphere reserve“** in all projects which are in line with the goals of the biosphere reserve
- use **turnover and employment figures** (on enterprise level as well as on the regional level) as suitable basic indicators for describing the economic well-being
- include more **economic issues (and economic experts**) in biosphere reserve co-ordination/ management
- be **"useful“** for the private sector in terms of building capacity in sustainable economics e.g. through the external **coaching and consultancy** of enterprises

- raise more public interest and increase visibility by **publishing success stories** on sustainable economic activities in the biosphere reserve through local media.

Furthermore it needs to be considered that when trying to assess socio-economic benefits

- socio-economic benefits need not necessarily be monetary
- cause-effect relations are very complex and those studies cannot be based on statistical material only.
- field studies may be the only feasible method to obtain valid data on regional sustainable economies, yet quantitative figures on economic development may be difficult if not impossible to obtain.

5. References

Nattermann, Sabine (2006): Nachhaltiges Wirtschaften im Biosphärenreservat Rhön – Evaluierung der wirtschaftlichen Impulse und Auswirkungen auf den Arbeitsmarkt. Diplomarbeit Universität Tübingen und Hohenheim. 120 pages.*Unpublished.*

Verwaltungstellen Biosphaerenreservat Rhön (2007) (editor): Erster Integrierter Umweltbericht für das länderübergreifende Biosphärenreservat Rhön *(Publication in preparation).*

Conclusions from Thematic Issue – IV
How to better reach and capture the economical and social benefits of biosphere reserves?

Doris POKORNY
Moderator

Pete FROST and Toomas KOKOVIN
Rapporteurs

Philippe PYPAERT and Maria PRCHALOVA
UNESCO Secretariat

A. The following case studies were presented:

1. Strategies for a sustainable economy in Biosphere reserves. Author: Dr. Ulrich Gehrlein, Institute for Rural Development Research. Germany.

Main findings:

- *BRs need to be large enough and include enough enterprises to set up a regional product cycle*
- *BR coordination offices need more economic experts and need to take over the task or be linked to existing regional business developers; BR as coop platform*
- *visibility (profile): BRs are competing with other approaches on sustainable economies e.g. through LEADER programme on the EU level; large overlap of goals*
- *SWOT analysis needed*

2. Development of sustainable tourism in Soutok area –a facilitated process of strategy preparation. Author: Petr Cupa, Lower Morava Biosphere Reserve. Czech Republic.

Main findings:

- *sustainable economies need to be based on a set of visions and goals for a sustainable tourism in the region, which are agreed upon by all stakeholders*

3. Economic valorization and uses of nature in Mont Ventoux biosphere reserve, constructing an identity with the contribution of anthropology. Author: M. Ken Reyna, Syndicat mixte d'Aménagement du Ventoux, BR coordinator

Main findings:

- *Labelling should not be restricted to products but rather to the general approach/ process of sustainable ecomies (-> partner enterprises which support the BR idea); certifying as an offer to create partnerships*

4. Jobs and the biosphere? Socioeconomic benefits in the Rhön biosphere reserve –Author: Doris Pokorny, Rhön biosphere reserve (Bavarian administration unit), Germany

Main findings:

- *Benefits (work places and turn over rate of enterprises) have increased but enterprises do not link their success to the BR. These need to promote the BR idea and the BR label*
- *visibility of the accomplishments of the BR is not clear because of multiple actors in the region*

5. Short report on the **„MAB Task Force on the Development of Quality Economies in Biosphere Reserves "** by Dr. Engelbert Ruoss, UNESCO Regional Office, Venice

- *Exists since 2002*
- *Amongst other activities has facilitated the setting up of a universal world wide BR label which can be used by BRs and BR companies if there is a certified labelling system in place in the BR*
- *A range of pilot sites use it already (e.g. la Palma)*

B. Issues/ questions to be adressed in case studies and in the discussion:

I- How to measure/assess socio economic benefit of the BR?

1. What are the social/ economic benefits?

- *Definition available from Task Force*
- *not only economical but also cultural assessment of economic but also socio-cultural changes necessary*
- *hard facts (figures) and soft facts (intangible benefits)*
- *jobs & money generation for the sake of human wellbeing as the intrinsic goal. BRs are therefore not a strict nature conservation area*
- *facilitation, catalyst function: BR provides arena to negotiate, resolve conflicts, common projects*
- *However: BR coordinators often lack expertise or even basic information on the economic situation in their BR*

2. What are (innovative) ways and success factors for providing economies to local people?

- *BR coordinators need to engage with local businesses/enterprises and build on this*
- *They also need support and attention from the national level: governments need to declare that BR are relevant to them and that they provide basic funding to make the BR operational*

3. Which approaches or indicators have been proven as being the most useful?

- *Basis must be the goal system for the individual BR ("what to achieve?")*
- *BR coordinators derive indicators from this which for them are feasible and possible to attain*
- *use of already existing indicator schemes e.g. MEA; EMAS;*
- *BR coordinators assess the goals for the BR on these indicators on a regular basis (e.g. like a business plan)*
- *clearing house on existing schemes;*

4. Actions for EUROMAB

4.1. UNESCO secretariat

- includes the same set of appropriate indicators in the nomination and the periodic review form in order to picture socio economic situation of the BR.

- publishes on the EuroMaB Website the availability of the universal biosphere reserve label procedure, the procedure of applying the label and the pilot sites which are already using the label.

- reactivates UNESCO Task Force on Quality Economies (with support of Venice) in order to carry out a scoping study on how BRs can provide social benefits and to review the experience with the application (success or failure) of the universal BR label in the pilot sites/experience with the label?

- Link the Nomination process to the commitment of the respective state that the new BR will be adequately staffed and funded to be operational and to the expectation that go with this (e.g. in what way the Br should/could become a model for the state level)

4.2. BR coordinators

- self assess their biosphere reserve in the periodic review along a set of indicators (qualitative and quantitative) which they deem to be necessary and available to best describe the current trend of the social and economic benefits of the BR, whether those have been increasing, decreasing or remained unchanged.

- report back on this to their National Committes on a regular (yearly) basis (like a business performance report).

4.3. BR National committees or respective bodies

- coordinate the reporting process (also providing translation for sharing of these reports/materials in the network)

II- Role of applied science for the BR in terms of increasing/assessing socio-economic benefits?

1. How is science/results of scientific research helping along this process? Can you assess the relevance of science/research results to achieve greater sustainability?

- *Research is NOT helpful is when researchers use BRs for their own ends/purposes rather than responding to local actors or BRs needs: BRs need to define their own research needs and guideline*

- *However: There is no specific "BR" research • lack of communication of already existing research projects in biosphere reserves whose results can be useful for others*

- *lack of social research rather than economic research (e.g. Interreg project INNOREF with three BRs; or la Palma BR)*

- *research also on the biosphere reserve topic, not only in the BRs*

2. How do you promote dialogue between researchers, planners, policy makers, citizens and other stakeholders to improve the integration of research outcomes into planning and management of the biosphere reserve and make activities and results visible in society?

- *researchers need to translate scientific results in a language asy to understand for the local people and decision makers; BR need to guide the process*

- *communication is difficult as BRs are about processes/transformation processes rather than only single issues*

3. Actions for EUROMAB

3.1. UNESCO secretariat

- provides a clearing house for already existing relevant research findings but also for data sources which are useful as well as partnerships/funding opportunities
- publishes the results on the EuroMab website

3.2. BR coordinators

- publish their research result in a "digested" version on the EuroMab website (support needed for translation)
- publish Cooperative research proposals to be published on the EuroMAB website in order to find research partners
- apply for research partners on EuroMab website
- carry out feasibility studies for sustainable economic practices for selected enterprises in the region in order to facilitate sustainable business development

3.3. BR National committees or respective bodies:

- help translating BR publications which are relevant for the EuroMaB Network so they could be published on its Website (in English language)

III- BRs as testing site for new approaches:

1. Is the biosphere reserve testing new approaches of new economic incentives? What could be helpful in order to strengthen this role?

- *Innovative examples are being used (e.g. regional currency (Canada), competition/award for farmers as to ecological and aesthetical value of their meadows in Grosses Walsertal BR and Rhön BR)*
- *Not only innovative approaches are useful but also the more effective use of the existing (<-> BR as model areas?)*

2. How can biosphere reserves build partnerships with governments, the private sector to form new economic incentives for landscape stewardships? What actions are taken for increasing its impact and visibility?

- *BRs need to be open to all economic branches e.g. Czech rep. Bio-Gas/ Oil company)*
- *Ban on those companies which are politically not correct or contradict the BR philosophy*
- *Slowfood association as very valuable and useful partner (experience on this in the Rhön BR)*
- *BRs need to use EU tools best possible (e.g. agrienvironmental programmes and others)*
- *Greatest asset of BRs: BR are longterm endeavour (not just short term projects)* *BRs are a basis for continuous and longterm use and further testing of project outcomes (EU,GEF)*

3. Are there linkages with the tools developed in the "Millennium Ecosystem Assessment" (MEA) (e.g. payment for ecosystem services, range of incentives types in biosphere reserves for stakeholders…)?

- *"payment for ecosystem services" is a new term which is not used in BRs but a lot of BRs have already implemented the idea/mechanism in practice: (e.g.*

incentives for compensation for adapted land management based on EU agro-environmental schemes; dry stone wall restoration in Cevennes BR with state and local/district money (fund) for conservation of cultural/ aesthetic ecosystem services but also prevent soil erosion

4. Actions for EUROMAB

4.1. EuroMAB
- makes a compilation on existing activities/ mechanisms for the implementation the payment for ecosystem services approach
- promotes on EU level the important function of agroenvironmental schemes for the BRs and offer BR to be used as testing sites
- serves as a clearing house for existing programmes and incentives which are useful for the BRs in the network

4.2. BR National committees or respective bodies
- promote the BRs as testing sites for national policies in the related field of interest
- publish main results attained

4.3. BR coordinators
- share their experience with innovative incentives on the EuroMAB Website
- BRs orient at their sustainable economies and the indicators to assess their development at the MEA ("wellbeing")

IV- BRs as learning platform (sharing inside the biosphere reserve, between biosphere reserves and outside biosphere reserves)

1. (How) to best share your experience ("best practices") with others?
- *inside sharing is as necessary as between BRs in order to gain the necessary level of visibility*
- *publications aimed at the general public*
- *best way of learning: exchange visits, preferably from local actors to learn from good examples and build personal links; EuroMab conference is very valuable for this!*
- *sharing experience with other BRs (EuroMAB website) but also in the framework of other programmes e.g. Interreg, Natura 2000*

2. Do you have a partnership project that you have initiated in the site, and that was replicated elsewhere?
- *several projects were copied from other biosphere reserves (e.g. Grosses Walstertal BR, Entlebuch BR, Rhön BR)*
- *e.g. part of it only with limited access (not for the public but for BR coordinators only)*

3. Actions for EUROMAB

3.1. EuroMAB Network

EuroMAB strengthens its coordinating body and organizational capacity:

- to facilitate the information sharing and follow up of actions and recommendations;
- to look after the network (structure is needed)
- to animate effectively thematic working groups

3.2. BR National committees or respective bodies

National committees being put in place where not yet existing and/or re-activated where already existing so that they fulfill an essential role in:

- coordinating the activities of BRs on the national level (e.g. care for the review process, assessments, translation services)
- serving as a clearing house between BRs and UNESCO
- promoting BRs as learning platforms especially on the national level

3.3. BR coordinators

- use the EuroMAB Website actively and passively and share all relevant information through internet; share their information
- BRs publish their review reports and yearly reports on the web and publish "digested info" on projects

Thematic Issue – V

How can biosphere reserves deal with environmental transformations such as urbanization and in-/out migration?

Background

Applicability of the biosphere reserve concept to urban areas has been discussed via the MAB Urban Group as well as in several forums and EuroMAB workshops since late 1990. Today, there is no such designation of Urban Biosphere Reserve in the World Network. However, there is a growing number of biosphere reserves which comprises urban areas, cities and more and more, the idea of cities and metropolitan areas to become recognized as a UNESCO MAB biosphere reserve is being investigated. Canberra, Cape Town, Istanbul and Rome are some of them. What are the trends and perspectives for the EuroMAB Network? What experience can biosphere reserves share on managing biodiversity, including cultural diversity in urban systems for reaching sustainability?

Key Issues

1. What is your experience of application of the concept in an urban biosphere reserve?
2. What are the consequences for the zonation scheme and for scale issues?
3. Do you have any data, information on the effects of human migration link to the creation /management of the biosphere reserve and their effects on biodiversity (job creation, local identity, strengthening regional economy)?
4. What are the experiences and tools developed in the Millennium Ecosystem Assessment that could improve the linkages between biodiversity and ecosystem services in an urban biosphere reserve (climate amelioration, soil formation, hydrological cycles, improving quality of air and water, health, environmental awareness, learning benefits..)?
5. Are you able to assess and monitor the relevance of urban biodiversity for the quality of life or urban dwellers including health and well being?
6. Do you have tools to monitor/assess the interactions between social and ecological systems to better understand how human agents affect urban ecosystems in the site?
7. How are the educational and health benefits being shared? Through which channels?

Expected Outputs

- Concrete recommendations for EuroMAB action plan: strategy, initiatives, cooperative programmes
- Contribution to the MAB Urban Group and the WNBR.

References

ICC 19th session paper available (pdf)
MAB Urban group
http://www.unesco.org/mab/ecosyst/urban.shtml
EuroMAB 2002 proceedings (PDF)
EU Habitats Directive
http://ec.europa.eu/environment/nature/nature_conservation/eu_nature_legislation/habitats_directive/index_en.htm
EU Urban Thematic Strategy
http://ec.europa.eu/environment/urban/thematic_strategy.htm
Leipzig Charter
http://www.eukn.org/eukn/news/2007/05/leipzig-charter_1049.html
Aarhus Convention
http://ec.europa.eu/environment/aarhus/
Millenium Ecosystem Assessment
http://www.millenniumassessment.org/en/index.aspx

Keynote Speaker: Rutherford PLATT, Nature, Law, and Landscape: Planning for a World of Cities

Moderator: Azime TEZER
UNESCO Secretariat: Christen ALFSEN-NORODOM

Presentations:
Thomas ELMQVIST, Urban Biosphere Tool for Sustainability

Ilke AKSEHIRLI, Azime TEZER, Ahmet Ozgur DOGRU, Urbanization, biosdiversity and consistency of urban biosphere approach with EU programs and global policies

Didier LECUYER, The Cévennes Biosphere Reserve and the partnership with urban communities

Peter FROST, European Union legislation and policies that may be influential in the context of Urban Biosphere Reserves

Vanja DEBEVEC GERGEVIC, Aspects of human ecology in the Park Skocjanske Jame, Slovenija Skocjan Caves

Urbanization, biodiversity and consistency of urban biosphere reserve approach with EU programs and global policies

Ilke AKSEHIRLI[*], Azime TEZER[**], Ahmet Ozgur DOGRU[***]

1. Introduction

Planning and urban design professionals have been always related with questioning and establishing better "nature" and "development" interactions since far back to post-industrialism with the severe and sudden impacts of rapid industrialization and urbanization. The first reaction of urban settlements to early problems of industrialization has been widely researched and well documented. "The City Beautiful Movement" and "The Garden City Movement" at the beginning of 1900's are related movements of urban planning and nature interaction (Platt 2004, Levy 2000). Later, Ian McHarg (1969) had significant influence of ecology and urban design interaction with his prominent work, "Design with Nature". They were the relevant stepping stones of ecologically sensitive urban planning practices in the last century. Ultimately, today, the need for having better interactions of urbanization, nature and community is beyond beautification efforts, but is an urgent necessity. Therefore, a better understanding of "urban ecology" is of increasing interest among the interrelated disciplines of social, biological and physical sciences (Nilon et al., 2003).

Nilon, Berkowitz and Hollweg point out that, after almost a decade of its establishment, the UNESCO's MAB Program initiated urban ecosystem projects in Hong Kong, Tokyo, Sydney and Rome for developing models of energy and mass flow balance. Urban and biosphere interaction only dealt with energy/resource consumption, pollution, population increase and life expectancy points of view rather than the reconciliation of people and their activities with nature (Boyden et al., 1981; Boyden, 1992; Golley, 2003).

Biosphere Reserves (BRs) are defined as "natural protected areas included in a global network organized by the UNESCO, and participating countries propose land and water sites within their boundaries as potential BRs." Having global or regional significance of biological conservation is an important feature for the acceptance of a protected area (Nations, 2004). As comprehensively assessed by the MAB Urban Group, "Urban Biosphere Reserves (UBRs)" indicate

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compatibility with the context of the Statutory Framework and the Seville Strategy (MAB Urban Group Policy Paper, 2003). This research paper assesses the "need and significance of BR approach for urban areas" in the teritory of Europe to give an openning in the way to Madrid 2008 World Congress of Biosphere Reserves.

2. Major Ecosystems and Rich Biodiversity Across Europe and Turkey

Europe with a wide range of biodiversty, hosts around 1.000 species of vertebrate animals, some 10.000 plant species and maybe 100.000 different invertebrates, not including marine species. There are 11 biogeographical regions in Europe, namely Arctic, Boreal, Atlantic, Continental, Alpine, Pannonian, Mediterranean, Macaronesian, Steppic, Black sea and Anatolian. The major ecosystem types representing the European landscapes contain agricultural, forest, fresh water, wetland, mountain, marine and coastal ecosystems (EEA 2003).

Farmlands, one of the dominant land use, have a great importance on biodiversity due to % 50 of all species in Europe depend on agricultural habitats. However %30 of continent's land area is still covered by forest, which remains a key ecosystem for biodiversity. With more than 3.000 plant species (80 % of them endemic) are amid the natural conifer forests of the Baetic and sub-Baetic Mountains in southern Spain which is one of the richest troves in Europe. European mountains host many endemic species. For example, more than 2.500 out of Europe's 11.500 vascular plant species are found mainly above tree line. Other rich spots in Spain are the Gudar and Javalambre mountains near Valencia. The mountain ecosystems with more than 1.000 plant species in the Pyrenees and the Alps are other biodiversity rich spots of Europe. Some coastal habitats, in particular, some islands in Europe (such as Azores, Maderia and Canary Islands) are rich in endemic plants. The Mediterranean basin, which has been identified by Conservation International as one of the world's 34 biodiversity hot spots, hosts the number of plant and animal species in Europe (EEA 2006a).

Tukey is at the eastern edge of Europe and constitutes a unique case of the Mediterranean Basin, and home to various and rich landscapes due to its bio-geografic location. Additionally it contains 3 of 11 biogeographic regions in Europe and demonstrates some important types of European ecosystems. These regions are: the Caucasian mountain forests with the temperate deciduous forest, including alpine meadows; Central and Eastern Anatolian Steppe grasslands and the Mediterranean region, which includes the world's largest remaining Cypress forests. The rich and varied ecosystems of Turkey have been the basis for the development of more than 3,000 endemic plants which are much more than all the endemic plants in the European continent together. Only few countries in Europe have similar number of animal species like Turkey, where it is estimated around

70-80,000. Particularly, Turkey with 454 different bird species recorded is one of the key countries for bird populations (SCBD, 2001).

Istanbul has a special importance with its socio-cultural, natural and socio economic characteristics among other cities of Turkey. Although its cultural heritage abundance is extensively welknown at global level, its biodiversity richness is not welknown such locally and globally. Acording to a research prepared by The Turkish Society for the Protection of Nature (DHKD) "Important Plant Areas (IPA) and Important Bird Areas (IBA) of Turkey" were identified in 2005. The definition of IPA was proposed by Planta Eurpa's Steering Commitee as "an Important Plant Area is natural or semi natural site representing exceptional botanical richness and/or supporting an outstanding assemblage of rare, endangered and/or endemic species and/or vegetation of high botanic value". In the report of DHKD, 200 candidate areas were identified and finalized with 122 sites all around Turkey and Istanbul consists of 10 different areas among them (Tezer 2006). The report indicates that Istanbul in 551,200 hectares area, accommodates almost 2000 native-vascular floristic and fern species and this number is higher than all Scandinavian and north-western European countries (UK, Denmark, The Netherland and Belgium).

3.Urbanization, Biodiversity Loss and Ecosystem Changes in European Countries and Turkey

Humans have a strong influence on the shape of environments and urban areas with high density of population and human activities can be described as one of the major factors of biodiversity loss and ecosystem changes. The ways of biodiversity loss and ecosystem changes, such as *habitat fragmentation, degradation* and *destruction, over-exploitation*, the spread of *alien species*, *climate change*, *pollution* and *waste production* mostly generated by urban-based activities. Direct and indirect effects of urbanization which cause significant pressures on biodiversity and ecosystem services can be classified into five major groups, namely land cover changes; socio-cultural factors; economic development; environmental factors and administrative failures (EEA 2003).

In Europe's environment: the third assessment report published by European Environmental Ageny in 2003, the main threats to biodiversity in European biogeographic regions were assessed and the most of the threats given in the Table 1, were generated by urban areas. (EEA 2003).

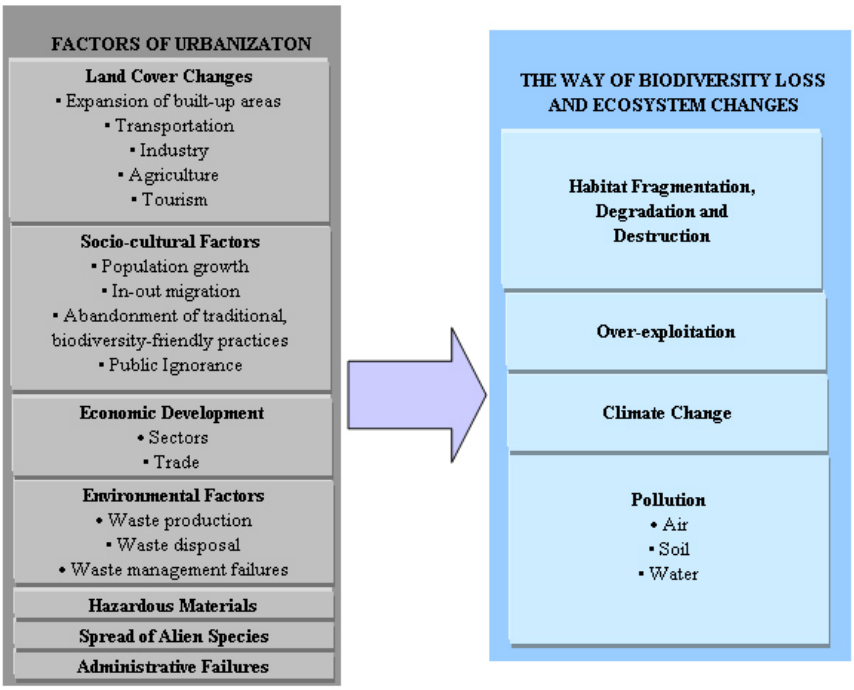

Figure-1. Urbanization and its links to biodiversity loss and changing ecosystem services

The capacity of ecosystem services on which natural and societal processes depends, is seriously disappearing or degrading by the impact of urbanized world. For instance, due to the increasing demand of drinking water, some of the world's most threatened wetlands are in the Mediterranean Region. Spain and Greece have drained 60 % of their wetlands in the last century (AAAS Atlas of Population and Environment 2007a). Turkey has around 250 wetlands and many of them have international conservation importance. However, approximately 200.000 of 1.280.000 hectares (15 %) of Turkey's wetlands have been dried-up since 1960's (SCBD 2001).

Over-exploitation, the spread of invasive *alien species* and *pollution* are other pressures on biodiversity-loss and ecosystem degradation. Biodiversity loss is described in the Millennium Ecosystem Assessment Report as one face of the degradation of the ecosystem services. According to the report, approximately 60 % of the ecosystem services (such as fresh water, air and water regulation, regulation of regional climate, natural hazards and pests control) are being degraded or used unsustainably (MA 2005). Urban areas with high rate of consumption and waste production make a serious contribution to the extinction of species and biodiversity loss. Governance disabilities**,** conventional economic failures and lack of public awareness are other significant factors effecting

biodiversity loss and ecosystem services in addition to tangible factors mentioned above (EC 2006).

Table 1: Biogeographic Regions and main threats to biodiversity in Europe (*Source: Europe's environment: the third assessment report, EEA 2003*)

Biogeographic Region	**Main Threats to Biodiversity**
Arctic	Climate Change Ozone Depletion
Boreal	Exploitation for hydroelectric power Fresh water acidification
Atlantic	High degree of habitat fragmentation by transport and urban infrastructures Invasive alien species
Continental	High degree of habitat fragmentation by transport and urban infrastructures Industry and mining Atmospheric pollution Intensive use of rivers
Alpine	Climate change Transport infrastructures Tourism Dams
Pannonian	Drainage of wetlands Minnig industry with heavy metals pollution of some rivers
Mediterranean	High pressures from urbanization in coastal areas Tourism Invasive alien species
Macaronesian	Tourism Invasive alien species
Steppic	Large minnig and industrial settlements with pollution problems
Black Sea	Water logging Tourism
Anatolian	Drainage of wetlands Building of dams

Today, less than 2 % of the Earth's land surface is occupied by urban areas and the population that lives in cities use 75 percent of the resources. The proportion of the world's urban population rose from 29 % in 1950 to 47 % in 1998. Experiences show that many environmental problems which create economic and social implications for urban areas generated by the expansion of urban areas. Europe is one of the most urbanised area on earth and approximately 75 % of the European population live in urban areas. 2.260 million hectares of Europe's total area (38 %) is occupied by build-up lands and the population density is 31 people per square kilometer since 2000 (AAAS Atlas of Population and Environment 2007b). The Netherlands, United Kingdom and Germany are the most densely

populated countries in Europe with 383, 242 and 231 people per square kilometer respectively.

With its wide range of biodiversity and high density of population, urban areas in Europe have to be considered as the lands where rapid biodiversity loss and ecosystem changes occur. Over the past 50 years "*urban sprawl*" has accompanied the growth of urban areas across Europe. During 1990-2000, urban areas increased 5, 4 % in Europe and more than 8000 km^2 land transformed from open land to urbanized areas. The rapid urban growth mostly occured, countries and regions with high population density and economic activity such as Belgium, the Netherlands, southern and western Germany, northern Italy, the Paris region or countries having rapid economic growth like Ireland, Portugal, eastern Germany, the Madrid region. (EEA 2006b). Today, 92 % of Belgium's population, 89 % of population of United Kingdom and 83 % of population of Germany live in urban areas and these rates are higher than European average (AAAS Atlas of Population and Environment 2007b).

Although European cities' population increase were not as much as in the past (33 %) urban expansion was still growing in cities like Palermo, Porto, Milan, Dresden, Cophenagen, Vienna and Prague since the mid-1950s. On the contrary, Istanbul with 600 % growth in population and 700 % in the built-up area experience the extreme rates of growth in population and build-up areas in this period (EEA 2006b, Tezer 2005). In the Istanbul case, migration can be described as one of the main reason of the extreme population growth. Migration from rural to urban areas which is one of the most important problems of Turkey has been observed in big cities of the country since 1950s. Istanbul with 5 % growth in population annually is the most populated city of Turkey. Although, the last two population censuses indicate that the increase rate has been slowing down to 3% annually, the rapid population growth contributes to changes in urban structure and causes significant pressures on natural resources. Since 1980s, forests and water basins located on the north of the city have been experiencing considerable degradation. Countinous building amnesties encouraged illegal and unplanned developments extensively on the pheriphery of both side of Istanbul during 1980s and 1990s. Housing supply was lack of ability to fulfill the demand in numbers and income structure of the inhabitants who were mainly migrants (Tezer, 2005). Turkey with highly slum population in metropolitan areas has been one of the most endangered countries in the developing world for the sustainability of biodiversity conservation. Although Turkey has the highest slum populatin ratio among the European countries, nearly 10.000 species of birds, mammals, reptiles, amphibians, fish and plant species are still constituting very rich biodiversity in the country. The Figure-2 shows total species number and urban population % living in slum conditions in Turkey and the European countries.

Rapid land use changes, intensification and expansion of urban built-up areas, leaving traditional (often biodiversity-friendly) practices and constructions are some critical factors of *habitat fragmentation, degradation* and *destruction* which are the principal reasons of urban biodiversity loss in most of the European cities likewise in Istanbul. Europe with around 1.000 species of vertebrate animals, some 10.000 plant species and nearly 100.000 different invertebrates and its' highly populated urban areas is one of the rapid biodiversity-loss regions observed. The Figure -2 shows urban population percentage in total population as well as total number of species (birds, mammals, reptiles, amphibians, fishes and plant species) in the European countries and Turkey. As it is presented in the map, Turkey, Spain, Portugal, Italy, UK, Germany, Ukraine and Russia are under the risk of biodiversity-loss as a result of their highly populated uban areas.

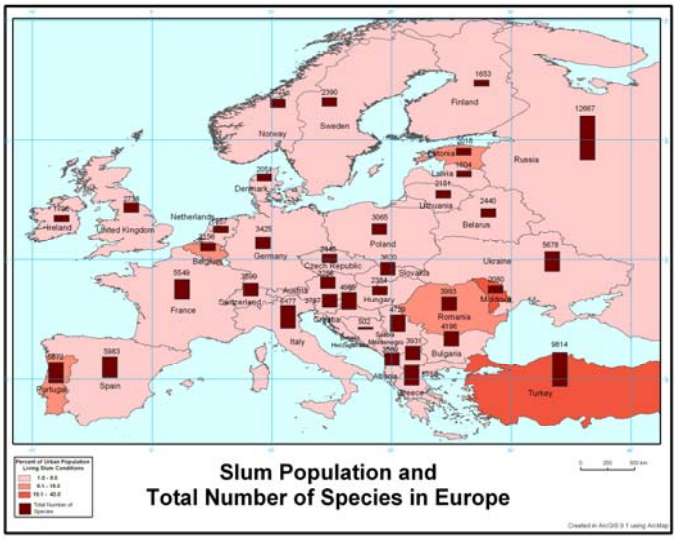

Figure-2. Slum Population and Total number of species in Europe
(*Produced by ESRI and WRI 2007a data*)

Today, the rate of biodiversity loss and the estimated number of threatened species in Europe are very significant like in other parts of the World. The World Conservation Union (IUCN) assessed the 3 948 globally-threatened vertebrate species since 2003, 335 of them occured in European and central Asian countries. Additionaly, EEA estimates 800 out of 32 000 globally threatened plant species will be extinct in Europe (EEA 2003). According to IUCN 15 mammals, 14 birds and 3 plant species in Turkey are declared in the "Red List of Threatened Species" in 2003 (WRI 2005). Total number of threatened species in the European countries are shown in the Figure-3. Germany, UK, Spain, Russia, Ukraine, Italy and France are seen as the most threatened countries in Europe.

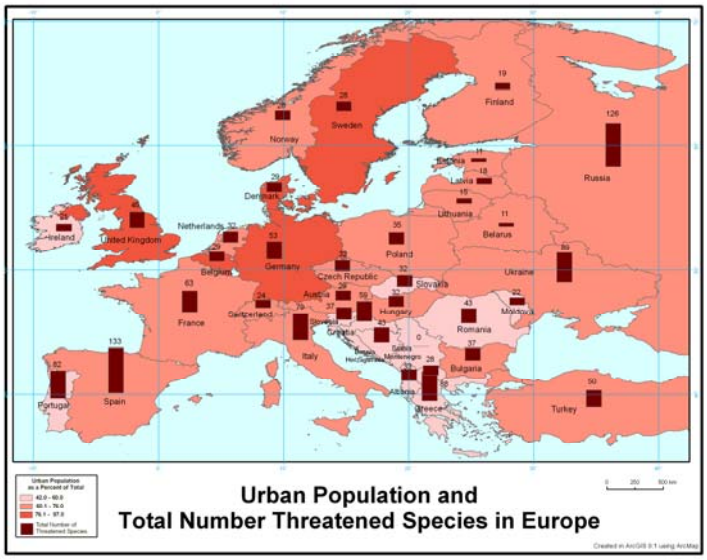

Figure-3. Urban Population and Total Number of Threatned Species in Europe (*Produced by ESRI and WRI 2007a data*)

Densely populated urban areas in Europe have been impinging on protected areas such as biosphere reserves. The map 4 shows that the urban populations as a percent of total population of Europen countries and the biosphere reserves numbers that they have. Germany with 88 % of urban population and 14 biosphere reserves, UK with 89 % of urban population and 9 biosphere reserves,

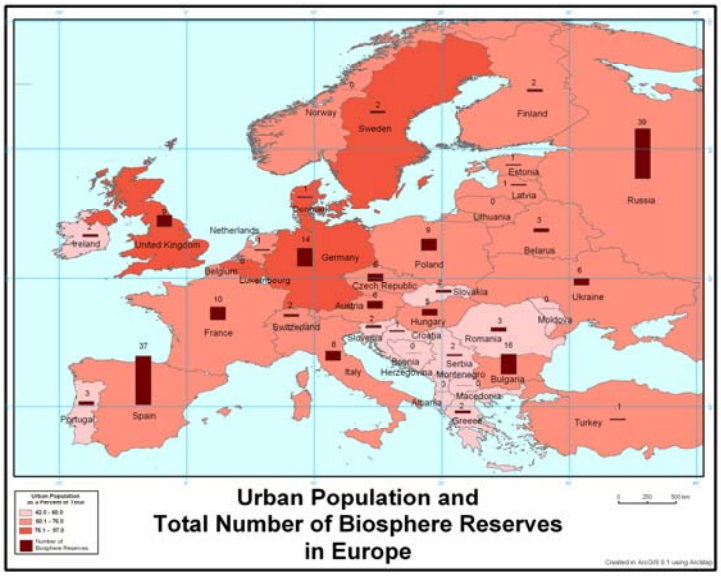

Figure-4. Urban Population and Total Number of BRs in Europe (*Produced by ESRI, EuroMAB 2007 and WRI 2007a data*)

Spain with 76 % of urban population and 37 biosphere reserves, France 76 % of urban population and 10 biosphere reserves, Russian 73 % of urban population and 39 biosphere reserves, Bulgaria 69 % of urban population and 16 biosphere reserves, Italy 67 % of urban population and 8 biosphere reserves and Polland 62 % of urban population and 9 biosphere reserves are the countries better observed the urban population pressures on biosphere reserves (WRI 2005 and UNESCO MAB Secretariat 2006).

4."Urban Biosphere Reserve Concept" as a Contribution to Maintain Urban Sustainability in Europe

Although urbanization is a global issue, which shows itself through rapidly changing land cover, changing population densities and a diversity of cultural practices, the topic "Urbanization and Urban Lanscapes" was recently identified as a priority (MAB Report 2002). The focus on factors such as percentage of urban land cover, rate of urbanization and urban sprawl, urban population, impacts of urban areas gained more attention since 1995 within UNESCO MAB Program. In the last few years the UNESCO Member States have started to consider about the issue of urban elements in Biosphere Reserves (MAB Urban Group 2003, Alfsen-Norodom et.al 2004, Tezer 2005).

The Seville Stratgey recalls a potential defininition of UBRs as "a BR characterized by important urban areas within or adjacent to its boundaries where the natural, socio-economic and cultural environments are shaped by urban influences and managed to mitigate these pressures for improved urban and regional sustainability" (The MAB Urban Group Policy Paper 2003).

Altough there is no clear definition or obvious restriction of UBRs' implementation in the Statuory Framework, this is the first important document before the Seville Strategy of UNESCO's MAB Program which rewiews the legal side of BRs for the "Urban Dimension". The Strategy drawn up by 400 experts from 102 countries and 15 international and regional organizations in Seville Conference in March 1995, seeks to identify "the specific role of biosphere reserves in developing new vision of the relationship between conservation and development". In the conference the second of ten key directions identified is that Biosphere Reserves should be developed "that include a wide variety of environmental, biological, economic and cultural situations, going from largely undisturbed regions and speading towards cities". However the 4th recommendation under Goal I would seem to be an implicit call for Urban Biosphere Reserves. With in context of the strategy, it is recomemmened to "…establish, strengthen or extend bioshere reserves as necesarry, giving special attention to fragmented habitats, threatened ecosystems and fragile and vulnerable environments, both natural and cultural". Additionaly, in The Strategy documents the explanation of the transition areas could be interpreted as a support for UBRs.

The Strategy explains that it "may contain a variety of agricultural activities, settlements and other uses and in which local communities, management agencies, scientists, non- governmental organizations, cultural groups, economic interests and other stakeholders work together to manage and sustainably develop the area's resources" (The MAB Urban Group Policy Paper 2003, Tezer 2005).

The Millennium Ecosystem Assessment (MA) emphasizes necessity for the development of new policies aiming at flexible adaptive management systems and governance of ecosystems from local to regional scales (UNESCO EuroMAB Group 2002). Therefore, Urban Biosphere Reserves (UBRs) concept has potential to integrate the MAB Program policies with the EU Biodiversity Strategies to maintain ecological sustainability in urban areas.

The creation of a coherent ecological network of protected areas called *Natura 2000 network* is at the centre of EU Biodiversity Strategies (EEA 2006a). EU biodiversity legislation goes back to the 1979 Birds Directive and the 1992 Habitat Directive. The Natura 2000 site consist of Special Areas of Conservation (SAC) and also incorporates Special Protection Areas (SPAs) under the Habitats Directive and the Birds Directive designated by the Member States. After ratifying United Nations (UN) Convention on Biological Diversity, the EU adopted a biodiversity strategy and biodiversity action plans in 2001 (conservation of natural resources, agriculture, fisheries, economic and development cooperation). In the same year, the EU pursued an influential step of natural protection by agreeing 'to halt the decline of biodiversity by 2010' (EC 2005).

Additionally, the integration of UBRs concept with multiple environmental initiatives and designations found in urban metropolitan regions could foster better connections among existing open space management areas, such as city parks, country recreation areas and wildlife sanctuaries, watershed areas, currently managed by different governmental organizations (Solecki and Rosenzweig 2006, Tezer 2005).

The report of European Environment Agency related to process halting the loss of biodiversity by 2010 can be useful to establish the biodiversity protection practices in urban areas. In the report, seven focal areas are used to outline EU headline indicators The focal areas are identified as the status and trends of the components of biological diversity, sustainable use, threats to biodiversity, ecosystem integrity and ecosystem goods and services, status of access and benefit sharing, status of resource transfer and use, public opinion (EEA 2006b).

Conservation, development and logistic functions of BRs can be used as a tool to provide biodiversity protection and improvement practices, long term ecological monitoring, sustainability experimantation and planning in urban areas. The

conservation function of BRs can contribute to adressing threats to urban biodiversity and the reduction of urban footprints (MAB Urban Group 2003). If the conservation activities can be expanded by "restoration" and "rehabilitation" of degraded ecosystems and habitats with innovative approaches, the urban biodiversity conservation at all levels will be supported more efficiently (Tezer 2006). Ecological restorations can be produced in a variety of ways. Private organizations or governmental services can take role to proceed nature restoration efforts. However the most efficient way to restore and maintain urban biodiversity is ideally to involve community. An efficient restoration should maximize the degree of public participation and awareness (Light 2006).

The conservation function of UBRs can also make important contribution to the maintenance of regulating services, such as the regulation of climate and food, disease control, waste reduction, and water quality, and supporting services such as soil formation, photosynthesis, and nutrient cycling (MA 2005).

The *development* function can foster all related activities to sustainable development (such as economic and human development) and contribute to the sustainable use of ecosystem goods and services (MAB Urban Group Policy Paper 2003). Public participation, community awareness and poverty alleviation programs and some sustainable practices, such as urban agriculture, community gardens, stream daylighting, habitat restoration, green designs, greenways, green roofs, natural hazard mitigation efforts, may support the development function of UBRs (Tezer 2006).

In this context, poverty alleviation emerges as an important aspect for sustainable development due to the role of poverty and health problems in urban areas. Economic activities based on natural environment may have a great potential to contribute to the development of urban economies. For instance, studies from the UK have shown that these kind of activities contribute €100 billion every year to the British economy and in Wales an estimated 1 in 6 of the workforce depends on the environment for employment (Dimas 2006).Conservation and development functions of UBRs have to be closely associated with poverty alleviation and sanitation activities and environmental policies should be focused to yield maximal benefits to the poor (Stanvliet et.al 2003). The Millennium Development Goals call for eradicating poverty and improving health as well as ensuring environmental sustainability (Irwin and Ranganathan, WRI Report 2007b). The Target 10 under Goal 7 aims to reduce the proportion of people without sustainable access to safe drinking water and basic sanitation by 2015 and the target 11 calls for having achieved by 2020 a significant improvment in the lives of at least 100 million slum dwellers (MDGs Report 2006). On the other hand, another aspect of the health issue can be related with the cultural ecosystem services in urban areas. Cultural services such as recreation, aesthetic enjoyment,

and spiritual fulfillment may provide a variety of physiological and psychological benefits to urban inhabitants. The creation of the facilities such as travel corridors and destinations for walking and cycling within the UBR concept can promote health and fitness in urban areas (Lusk 2006).

UBRs can provide *logistic* support for education, public awarenness, research and participation on nature conservation and sustainable use in urban development. The Helsinki European Platform for Biodiversity Research Startegy (EPBRS) meeting was held in Helsinki 17-19 November 2006. Two important issues, "urban ecology and biodiversity" and "youth and biodiversity", were discussed under the general theme of the meeting titled "How to reach the 2010 -and beyond - target: research influencing policy'. In October 2006 an electronic conference was organized to feed into the Finnish (EPBRS) meeting and five topics of the research priorities for urban biodiversity were identified. Priorities and recommendations of this e-conference (see Table 4 can be used for inspiring the UBR researches (EPBRS 2006).

Table 4. Research priorities and related recommendations to maintain urban biodiversity (*EPBRS 2006*).

Priorities	**Recommendation**
1. Relevance of urban green space for the urban dwellers.	Improve understanding of the attitudes of urban residents towards urban green spaces, and in particular to biodiversity
	Develop methods to encourage urban green space (including urban aquatic zones) both as learning areas and for biodiversity
	Improve understanding of the role of urban biodiversity in shaping people's understanding of global biodiversity conservation.
2. Functioning of urban ecosystems.	Develop research on the role of connectivity and linkage in urban ecosystems.
	Identify current and potential native, natural and semi-natural habitats as well as their connection with the green structures and corridors to the surrounding nature.
	Promote research on habitat patch and habitat matrix.
	Understand how urbanisation affects interactions between species and the physical properties of landscape
	Determine which processes are scale invariant or scale dependent.
	Better understand the complexity of ecological interactions and how they vary in relation to urbanisation.
	Explore the potential for 'green engineering' the built environment in a manner that maximises its ecological function.
3. Effects of human activities, such as habitat fragmentation, on urban ecology and biodiversity	Establish the role of disturbance in urban ecology.
	Establish how the density of the built form affects habitat / ecosystem performance in terms of its effect on key processes (e.g. run-off retention, nutrient cycling and so on).
	Research on understanding social-ecological complexity

4. Development of standardized methods and indicators across Europe for comparative assessment and monitoring of the state and trends of urban biodiversity.	Develop robust indicators, new ways of capturing and representing data (e.g. in GIS models), and modelling tools (e.g. decision support systems, spatially-explicit species models).
	Detailed studies on precise, spatially explicit patterns of distribution and species composition within cities and among cities using a common framework with finer resolution but larger extent (e.g. Europe)
5. Integrating urban ecological research into urban planning for the maintenance of biodiversity in urban areas.	Exploring the role of adaptive capacity in light of environmental change
	Better understand the conditions needed for more effective ways to manage urban ecosystem services.
	Promote the development of an integrative view of the whole urban socioecological landscape.
	Develop adaptive governance systems to support practical management.
	Promote mechanism-oriented (instead of being taxon-oriented) research to further develop urban ecological theory and provide effective planning and management guidelines.
	Promote ways in which to encourage interdisciplinary research in urban ecology
	Develop methods to present scientific findings in a comprehensible and accessible Way

5.Conclusions and Recommendations

Recently, the EU has started to consider about the capacity of Natura 2000 network to halt biodiversity loss. Although the Natura 2000 sites are being expanded, they only cover around 17,5 % of the teritory (consisting of the 15 old EU Member States). Therefore, it couldn't be sufficient enough to evaluate biodiversity loss based only on Natura 2000 sites (EPBRS 2006). Success of an ecological network mostly depends on better integration of wider protected areas in the region. At this point, the biosphere reserve concept can make a great contribution to halting European biodiversity loss, if it can be well integrated with EU's ecological network concept. EU Habitats Directive promotes to protect, preserve and improve the quality of life of the environment by strengthening ecological networks. BRs as being in hand already, will have significant role on this goal with their existing network and extended future programs regarding to urbanized areas.

Policies either on Natura 2000 or BR Networks are concentrated in the borders of those protected areas. It seems that, there is a weak understanding of relation on the edges of these areas and the policies mostly concentrated on inward interactions of those areas. Especially in urban areas, interaction with natural processes has to have better understanding for the sustainability of ecological processes. Therefore, ecological networks has to be defined under the sight of

urban interactions and pressures throughout Europe. For instance, different urbanization dynamics and ecosystem characteristics of Nordic and Mediterrenean countries has to clarify differerent future development policies in the development of UBR policies. Less urbanized Mediterranean countries will have more risk related to biodiversity-loss in coming years unless efficient conservation programs are not developed for their rich biodiversity habitats. Additionally, new BR designations will potentially spread through these countries (see Figure -5).

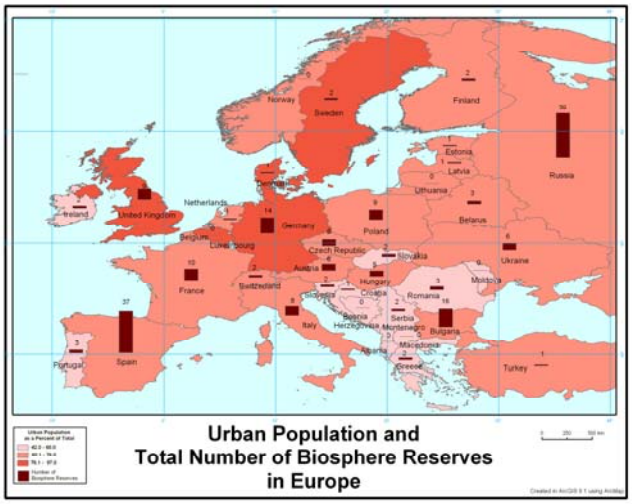

Figure-5. Urban Population and Total Number of BRs in Europe
(*Produced by ESRI, WRI 2007a and EuroMAB 2007 data*)

In the way to Madrid 2008 World Biosphere Reserves Conference, proposed EuroMAB policies regarding to UBR concept can be summarized as follows:

- to enhance biodiversity networking throughout European region by integrating different existing networks (IUCN sites, Natura 2000 sites, UNESCO BRs etc.)
- to improve development policies according to pressures coming from different urbanized regions regarding to threatened ecosystems/habitats (Mediterranean region's priority for degrading and biodiversity-loss)
- to present a framework for local authorities in urban planning/land use development practices
- to adopt better organizational processes for urban territories (administrative issues)
- to develop innovative policies for extending the contribution of public involvement in urban areas

Whether or not UBRs are a remedy for sustainable development, they will be influential for protecting biological diversity in and around of urban areas. It is obvious that the success on conservation of biodiversity will add tangible values to urban life through channels of supporting ecological services, public benefit, public awareness building, education purposes and economic gains.

6. References

AAAS, Atlas of Population and Environment, Freshwater Wetlands, American Association Fort the Advencement of Science, http://atlas.aaas.org/index.php?part =2&sec=eco&sub=wetlands , Accessed: 24 September 2007a.

AAAS, Atlas of Population and Environment, Urbanization, American Association Fort the Advencement of Science, http://atlas.aaas.org/index.php?part=2&sec= landuse&sub= urbanization, Accessed: 24 September 2007b.

Boyden, S., Millar, S., Newcombe, K., O'Neill, B., "The Ecology of a City and Its People: The Case of Hong Kong", Australian National University Press, 1981.

Boyden, S., "Biohistory: The Interplay Between Human and Society and the Biosphere, Past and Present", MAB Series, UNESCO, Vol. 8, Parthenon Publishing, 1992.

Dimas S., "Stopping the loss of biodiversity by 2010: Why nature matters. Why we are losing it. And what we in Europe can do about it" Brussels, 30 May 2006, SPEECH/06/333, Green Week Conference, http://europa.eu/rapid/pressReleasesAction.do?reference=SPEECH/06/333, Accessed:

EC,"Questions and answers about EU biodiversity policy", European Commission, MEMO/06/212, Brussels 22 May 2006a, http://europa.eu/rapid/pressReleasesAction.do? reference=MEMO/06/212, Accessed: 15 August 2007.

EC, EU Biodiversity Fact Sheet, European Commission August 2005, http://ec.europa.eu/environment/pubs/pdf/factsheets/biodiversity.pdf, Accessed: 21 August 2007.

EEA, "*Europe's Environment: The Third Assessment"* Environmental Assessment Report No. 10, Prepared by Ronan Uhel, Andrus Meiner, Peter Bosch, Project Manager Gordon Mclnnes, European environmental Agency, Luxembourg, 2003.

EEA, "*Progress towards halting the loss of biodiversity by 2010***"**, Tecnical Report No 5/2006, Project managers Tor-Björn Larsson and Rania S. Spyropoulou, European environmental Agency, Luxembourg, 2006a.

EEA, "*Urban Sprawl in Europe – The Ignored Challenge"* Technical Report No. 10/2006, Prepared by Ronan Uhel, Project Manager Ronan Uhel, European environmental Agency, Luxembourg, 2006b.

EPBRS, "Actions for the 2010 biodiversity target in Europe– how does research contribute to halting biodiversity loss?", The European Platform for Biodiversity (Bioplatform), the Repot of E-conference, October 2006, http://www.epbrs.org/PDF/EPBRS-FI2006-EU2010TargetShort.pdf, Accessed: 17 September 2007.

Golley, F. B., "Urban Ecosystems and the Twenty-First Century – A Global Imperative", in Understanding Urban Ecosystems, A New Frontier for Science and Education, Nilon, C. H., Berkowitz, A. R., Hollweg, K. S., (Eds), Springer, New York., pp. 401-416, 2003.

Levy, J. M., "Contemporary Urban Planning", Fifth Edition, Prentice Hall, 2000.

Light, A., *Ecological Citizenship: The Democratic Promise of Restoration* In: Platt R. H., The Human Metrolis: People and Nature in 21st- Century City, University of Massachusetts Pres, Boston , 2006, pp. 169-183.

Lusk, A. C., *Promoting Health and Fitness through Urban Design* In: Platt R. H., The Human Metrolis: People and Nature in 21st- Century City, University of Massachusetts Pres, Boston , 2006, pp. 87-102.

MA (Millennium Ecosystem Assessment). 2005. Ecosystems and Human Well-Being—Biodiversity Synthesis. Washington, DC: Island Press., http://www.maweb.org/proxy/ Document.354.aspx, Accessed: 15 August 2007.

MAB Urban Group, "Urban Biosphere Reserves in the Context of Statutory Frame work and the Seville Strategy for the World Network of Biosphere Reserves, Draft Policy Paper, June 2003, UNESCO, Paris,http://www.unesco.org/mab/ecosyst/urban/doc.shtml, Accessed: 10 September 2007.

Magnin G., Yarar M., "Important Bird Areas in Turkey", WWF Turkiye, Istanbul Turkey, 1997.

McHarg, I., "Design with Nature", Garden City, NY: Anchor, 1969.

Nations, J.D. "Biosphere Reserves" in International Encyclopedia of the Social & Behavioral Sciences, Elsevier**,** pp. 1231-1235, 2004.

Nilon, C.H., Berkowitz, A.R., Hollweg, K.S., "Ecosystem Understanding is a Key to Understanding Cities" in Understanding Urban Ecosystems, A New Frontier for Science and Education, Nilon, C. H., Berkowitz, A. R., Hollweg, K. S., (Eds.), Springer, New York, 2003.

Ozhatay, N., Byfiled, A., Atay S., "122 Important Plant Areas of Turkey" (in Turkish), WWF Turkiye, Istanbul Turkey, 2005.

Platt, R. H., "Land Use and Society, Geography, Law and Public Policy", Revised Edition, Island Press, 2004.

Secretariat of the Convention on Biological Diversity (SCBD), UNEP, The National Strategy and Action Plan For Biodiversity in Turkey, February 2001, http://www.cbd.int/doc/world/tr/tr-nbsap-01-p1-en.pdf, Accessed: 5 August 2007.

Sloecki, W. D., Rosenzweig, J., *A Metropolitan New York Biosphere Reserve* In: Platt R. H., The Human Metrolis: People and Nature in 21st- Century City, University of Massachusetts Pres, Boston , 2006, pp. 102-123.

Stanvliet, R., Jackson, J., Davis, G., Swardt, C., Mokhoele, J., Thom, Q., Lane, B. D., *The UNESCO Biosphere Reserve Concept as a Tool for Urban Sustainability* In: Alfensen – Nordom, C., Lane B.D., Corry, M. [Eds], Urban Biosphere and Society: Partnership of Cities, Annals of the New York Academy of Sciences 1023, New York, 2004, pp. 80-104

Tezer, A., "*Urban Biosphere Reserve (UBR) Concept for Sustainable Use and Protection of Urban Aquatic Habitats: Case of Omerli Wathershed, Istanbul"*, Ecohydrology &Hidrobiology, Vol.5, No.4, pp. 309-320,2005.

Tezer, A., "Local *Developments Versus Global Commitments:Reconciling Impact of Pheripheral Urbanization with Natural Environment, Istanbul Case"* International Forum on Urbanism-IFoU, Modernazition and Regionalism – Re-inventing the Urban Identity, Vol.1, pp.322-332, 2006.

UN, "*Millenium Development Goal Report 2006"*, United Nations, New York 2006,www.mdgs.un.org/unsd/mdg/Resources/Static/Products/Progress2006/MDGReport2006.pdf , Accessed: 15 August 2007.

UNESCO, EuroMAB Group, Report EuroMAB 2002, http://www.rmrs.nau.edu USAMAB/MAB_web_documents/euroMABreport23-04-03.pdf, Accessed: 2 September 2007.

UNESCO MAB Secretariat Divisions of Ecological and Earth Science, Biosphere Reserves, 529 in 105 countries, Paris October 2006, http://www.unesco.org/mab/BRs/ brlist.PDF, Accessed: 31 August 2007.

WRI, "World Resources 2005: The Wealth of the Poor – Managing Ecosystem to Fight Poverty", World Resources Report No.05, Prepared by Gregory Mock, Project Manager Peter Whitten, United Nations Development Programme, United Nations Environment Programme,World Bank, World resources Institute, Wahington, DC, 2005.

WRI, Biodiversity and Protected areas, Earth Trends Environmental Informations -World Resouces Institute, http://earthtrends.wri.org/searchable_db/index.php?theme=7, Accessed: 24 September 2007a.

WRI, "*Restoring Nature's Capital: An Action Agenda to Sustain Ecosystem Services"*, Prepared by Frances Irwin, Janet Ranganathan, Project Managers Frances Irwin, Janet Ranganathan, World resources Institute, Washington, DC, 2007b.

The Cévennes Biosphere Reserve and the partnership with urban communities

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In this contribution we will show how the Cévennes Biosphere Reserve, in the South of France, not far from the Mediterranean Sea, is trying to work more closely with the urban communities which are inside the protected area or in its surroundings. This improved way of working is made with the help of a tool, Agenda 21, but also thanks to the impulsion given by the new French law on national parks voted in April 2006. Agenda 21 is a comprehensive plan of action to be taken globally, nationally and locally by organisations of the United Nations, governments and major groups in every area in which humans impact on the environment. Agenda 21 was adopted, as the Rio declaration on environment and development and the Statement of principles for the Sustainable Management of Forests, by more than 178 governments at the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro in June 1992. Agenda 21 is a tool at the disposal of local communities to define their vision for the sustainable development of their area. For us, managers of Biosphere Reserves, this is a good tool to implement partnership with urban communities. We are going to present the approaches carried out with our technical help by two local communities in the Cévennes Biosphere Reserve, the Ales agglomeration (75 000 inhabitants) and the Gardon valley with its tributary the Galeizon valley (altogether 16 000 inhabitants).

For that we have to go back in time. A first participative process was carried out by the Galeizon valley (a tributary of the Gardon river) in 1990, a few years after our designation as Biosphere Reserve. This valley was chosen as pilot area for the whole Biosphere Reserve to implement the Man and Biosphere Programme. A plan of action was established and proved its efficiency. This kind of participatory approach was followed a few years later by two other communities, the Hautes Cévennes and the Valdonnez area. Recently some other areas, the Ales agglomeration and the Gardon Valley decided to carry out the same kind of approach, with a tool internationally recognised, Agenda 21, which was defined in 1992, two years after the start of the Galeizon process. So we can speak about the snowball effect of the pilot area. The Ales agglomeration Agenda 21 has been

adopted and the Gardon Valley Agenda 21 is on the verge of being published. Its approval by the local councils is planned for January 2008.

Agenda 21 is a good opportunity for the local communities to think about the sustainable future of this area, considering it globally with its rural and urban dimensions. We are going to give some examples of this, illustrating various different issues, which are recognised locally as important, but which were also recognised as key factors by the working group which made proposals about the development of Mediterranean-type ecosystems. As these two areas have rural and urban components we will speak only about issues related with urban problems.

Rampant urbanisation and **urban sprawl** are main issues. The Cévennes area is attractive for permanent residents and tourists, as is most of the coast of the Mediterranean, because of the favourable climate and the proximity of the sea. The French institute for statistics (INSEE) forecasts that in our region, the Languedoc-Roussillon, the population will grow by +30% by 2030. Globally speaking, half the world's people live today in cities and this proportion is expected to grow to 61 percent by 2030. How can we control the extension of urbanisation with regard to the natural and cultural heritage? How can we economise space? The planning of land-use is really important if we consider the great pressure on land in our region for urbanisation, tourism and many other different uses. Another issue is how to adapt new constructions to the traditional know-how of building, considering the use of new technologies for eco-construction and economy of energy. Urbanisation can be a **threat to the health** and well-being of the inhabitants. One of the engagements of the Agenda 21 of the Ales agglomeration is to work with professionals (doctors, psychologists, social workers), to educate citizens about health hazards and prevention of disease. Its objective is to improve the health of every citizen with the development of a health network emphasising the prevention of disease (RESEDA). Another action is the monitoring of the quality of air. **Forest fire prevention** is an other issue: This area is very sensitive to the risk of fire. How can better management of rural activities limit this risk? In the Gardon Valley, Agenda 21 actions were proposed to improve forest management (more than 85% of the land coverage) with the idea of creating a network of wood energy (production of wood chips for heating) and install some new farmers to graze the land close to the inhabited settlements. This kind of action will also limit the risk of fire close to urban areas.

Landscape protection and restoration is a field of action that we find in the two Agenda 21. The goal is to improve the capacity of the protected area to preserve and restore natural areas in and near cities, involve urban residents, and build stronger urban constituencies for nature conservation. One of the local issues is

the restoration of former coal mining installations used during the mining period of the last century. The local authorities emphasize the importance of protecting **biodiversity**. In the two Agenda 21 actions are carried out to make an inventory and monitor the biodiversity with the help of local inhabitants and to combat invasive species of plants. For example in the Galeizon valley the local community is in charge of an action plan to limit the propagation of acacia and preserve the willow and alder trees. This action will preserve the natural habitat of the European beaver, which lives in this valley. In the Ales Agenda 21 the community is developing the international centre for Pomology and creating conservatory orchards. **Water supplies** are likely to become less reliable: The two Agenda 21 intend managing the water resources more carefully. They are determined to economise the use of water for all kinds of activities. They want to ensure that the low water mark is respected during the summer. These two main issues, protection of the biodiversity and water resources, are directly related to global warming.

Education. City dwellers tend to be increasingly less connected to nature and consequently the quality of their lives is diminished and they may behave irresponsibly towards the environment. Ensuring residents have access to nature, educating citizens about the distinctive character of their surroundings and the many benefits which derive from natural resources are aims inscribed in the local Agenda 21. The local communities and the Biosphere Reserve staff are convinced that urban residents learn to appreciate nature by having access to outdoor pursuits rather than by conventional education. They decided to elaborate a code of good practice in the natural areas, which aims to improve the city dwellers' knowledge of the environment and its fragility. One of the local issues is monitoring mushroom picking and gathering sweet chestnuts, because many urban dwellers do not realise that the land is privately owned not a wilderness…The Agenda 21 is an approach which enables communities to become more sustainable and adopt a new policy which recognises the **interdependence of towns and rural surroundings** and the existence of a protected area in the vicinity. Towns can be pilot areas for sustainable development. In the Agenda 21 actions are carried out for the development of renewable energies, and in particular the development of solar energy, considering our favourable climate. Agencies responsible for protected areas can serve urban residents through conventional activities such as preserving, restoring, and interpreting natural areas in and near cities, but also through less conventional roles such as helping disadvantaged people, working to bridge social divisions through shared experiences in nature, and helping to promote sustainable development in cities.

Agenda 21 is a tool which promotes a new **governance** where the problems are considered in their entirety. The conservationists are encouraged to work with urban officials, managers and planners. This approach allows citizens to

participate in the process. This is the opportunity for urban managers to incorporate ecosystem management approaches in their planning and management. In the two local Agenda 21, the local authorities decided to produce a guide to evaluate projects according to the principles of sustainable development. A first draft was elaborated in 2007 by a group of planning officers of the Cévennes, co-ordinated by the Biosphere Reserve staff. This document will be submitted for approval by the local authorities in the beginning of 2008. Most of the issues presented above were highlighted by working groups in the IUCN framework. The Malibu declaration about cities and conservation in Mediterranean-type ecosystems stresses these problems. We can also read the papers produced by the Task Force on Cities and Protected Areas of the World Commission on Protected Areas of the IUCN-The World Conservation Union. The Working Group on Urban biosphere reserves, which has been set up within the Task force, made proposals in this field. The Mab Urban Group also stressed these issues.

During the elaboration of the two Agenda 21, the National Park / Biosphere Reserve Board made reforms for better management of this protected area, aided by the new French law on national parks voted on the 14 April 2006. Local authorities are now better represented on the enlarged Board. A new commission was created to advise the Board: the Commission for Sustainable Development and Local Partnership. Every group of local communities is a member of this commission. There is a sub group with officers of the communities. Also the relationship between the National Park /Biosphere Reserve board and the town of Ales was developed. The Board decided to create an additional office in Ales. An agreement between the National Park / Biosphere Reserve authority and the Mayor of Ales with a pluri-annual action plan will soon be signed. Another recent change is the participation of the Biosphere Reserve staff in the elaboration of urban land-use planning in the whole Cévennes area. The French law on national parks requires the national parks' participation in the elaboration of planning documents, at the community level, and on a wider level (« country »). With this new mission devolved to the Park by the new law, the biosphere reserve staff can provide advice, ensure that the main issues of the area are taken into consideration, sustain innovation (new energies, ecobuilding, harmony between traditional and modern building). It can help local communities create guidelines for new buildings in existing towns and villages.

Within the same new law, the Cévennes National Park can, for the first time since its creation in 1970, modify its limits. This is a good opportunity to adjust the limits of the boundary zone of the Park to correspond with the transition area of the Biosphere Reserve, thus enabling the inhabitants to have a clearer understanding of the area. The main issue is : Should we include urban areas in the Park ? Reflection is under way, but we can note that the members of the National Park / Biosphere Reserve Board are very reluctant to include even the

smallest towns of about 5000 inhabitants! They are afraid that by thus enlarging, the Park will lose its rural character. Furthermore the previously quoted new French law requires the National Park to establish a charter for the management of the area before 2011. The two Agenda 21, with their territorial vision of the future, can be considered as the first step toward the elaboration of this charter. The participative process involved makes them very legitimate. This method seems much better to us than writing a text first and afterwards asking the local communities to make comments!

Conclusion

For a few years, the international Biosphere Reserves network has been conscious of the necessity to take into account the view of city dwellers in the management of these sites. Some recent Biosphere Reserves were established around big cities like Cape Town and some people request the creation of Urban Biosphere Reserves in different regions of the world. Irrespective of the answer to this question, this case study stresses the fact that the existing rural Biosphere Reserves have the opportunity to work more closely with the towns which are in their neighbourhood. Agenda 21 is one of the tools at their disposal to do so, and this tool has the advantage of being internationally recognised. This partnership between the protected areas and the towns can take a lot of different forms. In the Euromab network it would be interesting for the biosphere co-ordinators to share their experience in this field.

Further reading

The Urban Imperative: Urban outreach strategies for protected area agencies, proceedings of a workshop at the Vth World Parks congress, Durban, South Africa, 8-17 September 2003.

Blondel J. and Aronson J., 1995. *Biology and wildlife of the Mediterranean region*, Oxford University press, Oxford.

Bouamrane, M (ed).2006. *Biodiversity and stakeholders: concertation itineraries*. Biosphere Reserves-Technical Notes 1. UNESCO, Paris.

Douglas I., Box J. (eds), 2000, *The changing relationship between Cities and Biosphere Reserves.* Report for Urban Forum of the UK Mab Committee, derived from a workshop held in Manchester in 1994.

Lecuyer D, 1999. *Local Involvement in the Cévennes Biosphere Reserve*. In the proceedings of the 3rd Euromab biosphere reserve coordinators'meeting, Academy of Finland, Helsinki.

Louche, Y, 1995. *The Galeizon conservation-development project or the involvement of local communities in carrying out the Mab programme*; Proceedings of the Seminar for Managers of Biosphere Reserves of the EuroMab Network, Florac.

Rundel P.W., Montenegro G.,. Jaksic F.M, eds, 1998. *Landscape disturbance and Biodiversity in Mediterranean-type Ecosystems*, Springer, Berlin.

Trzyna T, 2007*, Global Urbanisation and Protected Areas: challenges and opportunities posed by a major factor of global change- and creative ways of responding,* Sacramento, California Institute of Public Affairs / Interenvironment for IUCN, the World Conservation Union.

European Union legislation and policies that may be influential in the context of Urban Biosphere Reserves

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There are a number of European Union directives and regulations which are of interest when considering the creation of an Urban Biosphere Reserve, and not all of these relate to the conservation of biodiversity.

The Statutory Framework of the World Network of Biosphere Reserves (1) requires that local communities are enabled to participate in the design and carrying out of the functions of every Biosphere Reserve. Additionally the Seville Strategy (1) directs that the management of each Biosphere Reserve is promoted as a pact between the local community and society as a whole. The Aarhus Convention (2) guarantees the right of every citizen of signatory states to participate in environmental decision making, and this right has been transposed into an EU directive (3). Whilst this stops some way short of the spirit of the Seville Strategy, the Convention and Directive give the legal basis for participative management of all Biosphere Reserves in the European Union.

Biosphere Reserves are intended to reconcile the conservation of biodiversity with economic and social development and the maintenance of cultural values (1). The EU Habitats Directive (4), which is the key instrument for biodiversity conservation in Europe, seems to fit perfectly with this ambition, noting that economic, social and cultural requirements must be taken into account during its implementation, and that biodiversity conservation may require the maintenance or encouragement of human activity. The UNESCO UK MAB Committee recommends that in order to meet the requirements for a legally constituted core area, new nominations for Biosphere Reserves in the UK should have core areas based around Special Areas of Conservation as defined in the Directive (4). This ensures the core area is subject to the highest degree of legal protection, and gives an indication of the international importance of the core area as part of the Natura 2000 network of protected sites.

EU policy on urban areas has tended to concentrate on reducing urban sprawl and improving urban air quality. The EU Urban Thematic Strategy (5) adopted in January 2006 is no exception, but does propose guidance on integrated environmental management for urban areas and pledges support for networking and exchange of best practice as well as for urban research under the EU 7th Framework Programme. This strategy could be useful as a basis on which to build the kinds of city-region cooperation which would be required to create the authority or mechanism to implement the management policy or plan for an Urban Biosphere Reserve.

Similarly, the recently adopted Leipzig Charter (6) recommends the creation of integrated urban development strategies. The management plan or policy for an Urban Biosphere Reserve could be created as such a strategy in response to this recommendation.

These are just a small sample of the more obvious EU legislation and policies which might have an impact or be of use in the context of Urban Biosphere Reserves. There are undoubtedly more which could be of use and the author would be interested to learn of any which readers discover after reading this article.

1. Biosphere Reserves: The Seville Strategy and the Statutory Framework of the World Network. UNESCO Paris 1996

2. Convention On Access To Information, Public Participation In Decision-Making And Access To Justice In Environmental Matters done at Aarhus, Denmark, on 25 June 1998. For further details see: http://ec.europa.eu/environment/aarhus/

3. Directive 2003/35/EC of the European Parliament and of the Council of 26 May 2003 providing for **public participation** in respect of the drawing up of certain plans and programmes relating to the environment and amending with regard to public participation and access to justice Council Directives 85/337/EEC and 96/61/EC

4. Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. For the full text see: http://ec.europa.eu/environment/nature/nature_conservation/eu_nature_legislation/habitats_directive/index_en.htm

5. Communication From The Commission To The Council And The European Parliament On Thematic Strategy On The Urban Environment {SEC(2006) 16 } (see: http://ec.europa.eu/environment/urban/thematic_strategy.htm)

(6) LEIPZIG CHARTER on Sustainable European Cities (available via http://www.eukn.org/eukn/news/2007/05/leipzig-charter_1049.html)

Aspects of human ecology in the Park Škocjansje Jame, Slovenija- Škocjan Caves

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"To be human is to live in a world that is filled with significant places."
(Vranješ, 2004, quotation by Relph, 1976)

Park Škocjan Caves is located in South Eastern part of Slovenia. It was established with aim of conserving and protecting exceptional geomorphological, geological and hydrological outstanding features, rare and endangered plant and animal species, paleontological and archaeological sites, ethnological and architectural characteristics and cultural landscape and for the purpose of ensuring opportunities for suitable development, by the National Assembly of the Republic of Slovenia in 1996.

Due to their exceptional significance for cultural and natural heritage, the Škocjan Caves were entered on UNESCO's list of natural and cultural world heritage sites in 1986.

In 1999, the Škocjan Caves were entered in the Ramsar Directory of Wetlands of International Importance as the first European Ramsar locality in accordance with the guidelines for the designation of underground wetlands. In October 2004, the Škocjan Caves Park was included in the world network of biosphere reserves MAB – "Man and the Biosphere" of the UNESCO's MAB programme as the Karst Biosphere Reserve. The parks borders are well determined by The Škocjan Caves Regional Park Act, 1996.

The core zone of The Karst Biosphere Reserve encompasses 413 ha and the buffer zone covers the Reka River basin of 45.000 ha on flysch rock layer. The transition area is 7 390 ha large and lies entirely on limestone area. Three villages are included in the core zone of The Karst Biosphere Reserve: Škocjan, Matavun, Betanja. There is one large town Ilirska Bistica in the buffer zone in a distance of 52 km from the park and small town Divača in transitional area in distance of 5 km form the park. In the core area there are 68 people permanent residents, in buffer area 8000 and in transitional area 3829.

Human ecology considers ecosystems as interactions of living and non-living organisms and man, who has taken over the leading role in the search and creation

of material benefits in nature and as an interdisciplinary science examines man's adaptation to a given environment.

Human ecology enables an integrated approach in the solving of problems related to the protection and conservation of natural environment, represents the source of methods and strategies for the study of man's quality of life and thus offers scientific bases for the introduction of sustainable development.

For the efficient management of biosphere reserves, it is essential to introduce integrated monitoring which includes the social component of human actions and existence and emphasizes education as an important strategy of society's functional adaptations.

The importance of sustainable development of protected areas must be evident from the programme for action and management, which may include a model system with natural scientific and mathematical components. In this way, it is possible to present the system comprehensively and prepare forecasts and measures.

Human ecology as an interdisciplinary science examines man's adaptation to a given environment. Interdisciplinarity and the connection of social sciences with natural sciences provide it with functional implementation of tools for the interpretation of changes and education. These are of crucial importance for the establishment of sustainable development in a given area, locally, regionally and globally, which is the basis for long-term preservation of human health. In the park special activities are focused to the caves environment, from historical point of view it represents the source of income for local people. The tourist activity was already developed in the early 19th century. Today's research projects are focused on quality of caves microclimate, in order to enable the cave to remain as pristine as possible due to tourism and on the other hand to provide safe environment for people who work in the caves, and on quality of the water that flows from buffer zone to the underground world an then to the sea in Italy. In preparation of BRIM programme we have prepared some free indicators to be evaluated beside biotic and abiotic in relation to specificity of the caves.

Human ecology may provide suitable knowledge for the evaluation of protected natural areas both from the point of view of consequences of active human existence, ecosystem adaptations and social relationships which condition the existence of content-structured space in nature. Park Škocjan Caves established several research monitoring projects such as quality of the water in karst ponds, bio indicators of ozone layer, which represent with every days data from our meteorological station useful tool in public awareness related to pollution and climate change. In 2008 we will celebrate fifth anniversary of establishment of

our schools network, where we join in research education programmes five elementary schools form Sovenia and two from Italy. They are all located beside the surface and underground flow of the Reka River. With teachers help we promote science studies but also encourage children to do social projects in order to keep intergeneration connections and gain knowledge of past experience and life from our grandparents. These activities provide us with useful optional indicators that include also social elements in performing BRIM programme.

The changing man – nature relationship influences the values that people have with regard to nature. The goals that foresee nature control and the presumed nature improvement seem less important than the goals of reunification and co-operation with nature. The concept of nature and the environment expresses the cultural identities of the world. This concept must provide people with an adequate explanation of the natural phenomena in order to help people to understand, foresee and change typical environmental environment. This is the basis of stability and a secure placement of man into a space: both a natural and cultural one.

Taking into account the fact that ecological safety can be recognized as one of the human freedoms in addition to those of economic regime, social opportunities, safety and protection we believe with adequate knowledge and course of conduct, we will be able to assess global changes and contribute new solutions to the network of protection and conservation of world's biosphere reserves.

Thus the world will not only be full of significant places but also, as a whole, a significant place for man.

Further readings

Alcamo J., Bennet E. M. et al. 2003. Ecosystems and human well-being. Millennium Ecosystem Assessment report of the conceptual framework working group of the millennium ecosystem assessment. Sarukhán J., Whyte A. (ur.). Washington, Island Press: 245 str.

Arico S., Batisse M.,Bouamrane M., Clűsener-Godt M., Dogsé P., Grabner U., Quinli H., Hebel A., Hőft R., Jardin H., Karet C., Mankoto Ma Mbaelele S., Mehndiratta S., Roberston Vernhes J., Sankey T., Schaff T., Thulstrup H., Vestin K. 2002. Biosphere reserves: Special places for people and nature. Hadley M. (ur). Paris, UNESCO: 208 str.

Barbault R., Guéga J. F., Hoshi M., Mounolou J. C., van Baalen M., Wake M., Younès T. 2004. Integrative biology and complexity of natural systems: Keys to addressing emerging challenges. Biology International, 44: 6 – 12

Bodini A. 2003. The science of ecology for a sustainable world. V: Knowledge for Sustainable Development. Encyclopedia of life support systems. Vol. 1. Badran A., Gobaisi A. D., Tayeb M. E., Tolna M. K., Sage A. P., Marchuk G. I., Johns A. T., Lundberg H. D., Szollosi-Nagy A., Chester G., Younes T., Dempsey J., Rao Prasada G., Sabouni R., Makkawi B., Woldai A., Agoshkoy V. I., Hornby R. J., Wall G., Watt H. M., Kotchetkov V., Al-Radif A., Sasson A., Bruk S. (ur.). Oxford, EOLSS: 715 – 732

Boyden S. 1992. Biohistory: the interplay between human society and the biosphere - past and present. Man and Biosphere Series, 8. Pariz, UNESCO, The Parthenon Publishing Group: 265 p.

Debevec A., et al. 2002. The Škocjan Caves Regional Park, Škocjan,101p.

Lass W., Reusswig F. 2002. Social monitoring: meaning and methods for an integrated management in biosphere reserves. Report of an International Workshop. Rim, 2 – 3. 9. 2001, Biosphere reserve integrated monitoring (BRIM) series No.1. Paris, UNESCO: 33 p.

Park Škocjan Caves Management plan for the period 2006 – 2010, Official Gazette of Republic Slovenia, No. 138/06

The Regional Park Act of Park Škocjan Caves, Official Gazette of Republic Slovenia, No. 57/96

Vranješ M. 2004. Place attachment: a case study of the Bovec region. Annales, 14, 1: 85 – 96

Wolanski N. 1991. Human Ecology, Medicine and Anthropology. Coll. Antropol., 15, 1:7 – 26

Conclusions from Thematic Issue – V

How can BRs deal with environmental transformations such as urbanization and in/out migration?

Azime TEZER
Moderator

Glen HYMAN and Karl Heinz GAUDRY
Reporters

Pete FROST
Volunteer Contribution

Christine ALFSEN-NORODOM
UNESCO Secretariat

A. Discussions subjects and questions

1. What is your experience of application of the concept in an urban biosphere reserve?

2. What are the consequences for the zonation scheme and for scale issues?

3. Do you have any data, information on the effects of human migration link to the creation /management of the biosphere reserve and their effects on biodiversity (job creation, local identity, strengthening regional economy)?

4. What are the experiences and tools developed in the Millennium Ecosystem Assessment that could improve the linkages between biodiversity and ecosystem services in an urban biosphere reserve (climate amelioration, soil formation, hydrological cycles, improving quality of air and water, health, environmental awareness, learning benefits)?

5. Are you able to assess and monitor the relevance of urban biodiversity for the quality of life or urban dwellers including health and well being?

6. Do you have tools to monitor/assess the interactions between social and ecological systems to better understand how human agents affect urban ecosystems in the site?

7. How are the educational and health benefits being shared? Through which channels?

8. What key directives of EU biodiversity and habitat protection regulations can be influential to assess urban dimension of BRs?

9. What key stakeholders in the context of innovative ways have to take part in an urban biosphere reserve initiative?

10. Can you assess the limitations and advantages of existing management structures of BRs for urban scales?

11. What concrete actions can be proposed for the EuroMAB Action Plan?

B. Recommendations and Concerns for the World Network

Nomination and Review Procedures

1. In the consideration of BR nomination forms and periodic reviews, attention by the site to its urban areas within its influence should be considered a strength; should a site obviously fail to address such issues, the BR Advisory committee should consider referring the case back to the relevant national committee.

2. In order for BR status to add real value to a site, it is not necessary to create an additional layer of institutional complexity. To function, however, all BRs must facilitate cooperation. A mechanism for ensuring this, such as "Cooperation Plans" should be made a requirement for acceptance onto the WNBR.

3. The process of seeking designation as a BR is using useful, in and of itself, as it brings stakeholders together. Therefore a"no regrets" approach to nominations should be encouraged among prospective sites.

4. Over time, the BR concept evolves, and the nomination form should evolve to reflect this. In order for the World Network to evolve in step, the periodic review form should mirror the nomination form. In this way, the usefulness of the nomination process may be repeated periodically for the whole World Network.

Evolution of the Concept

5. The word "reserve" has been found to be unacceptable to a number of sites, including some in urban areas. We recommend that this word is dropped from the description.

6. We recommend that the Madrid Conference considers whether the core areas of UBs should be hotspots of biodiversity or could also be areas critical for the provision of ecosystem services.

7. Given the need for projects which address the massive flows of people, energy, material and biota through urban systems, the transition zone of UBs should retain a boundary which is able to flex in time and space.

8. We recommend that the Madrid Conference considers the voluntary adoption of two further zones by all forms of Biosphere Reserve: Cultural Core Areas and Cultural Buffer Zones—as developed in Florianopolis in the Mata Atlântica.

C. The EuroMAB Action Plan

Building EuroMAB Network Identity

Whereas EuroMAB Works in a highly populated and urbanised area, we recommend that:

The EuroMAB Network should offer a leadership role in driving forward the Urban Biosphere agenda;

As within the European Union, there is legislation which may be used to support the management plans and processes required by UBs which encompass a city or city region, we note:
Natura2000 Special Areas of Conservation (SACs and the SPAs) would be ideal as Biosphere core areas, by virtue of the protection and recognition the 'Habitats Directive' affords them.

For member states of the Council of Europe, the Bern convention establishes the Emerald Network of Areas of Special Conservation Interest, which would be of similar use as biosphere core areas.

Mission

Because the Biosphere concept is so flexible, dynamic and participative, it's EuroMABs vision that these qualities should be made available to all of its citizens, across all of its member states, be they in rural or urban areas.

Given the densely populated nature of our area, EuroMAB should encourage the development of more Urban Biospheres.

Objectives

To seek full and active participation of all of the member states of the EuroMAB network, by explicitly communicating the benefits arising from use of the Biosphere models.

EuroMAB Actions and Activities
Networking of Cities – As part of its leadership role, or EuroMAB should coordinate a network of urban areas with an interest in the use of the Biosphere Concept. This network might become the forerunner of a global MAB thematic network of urban sites.

At the next EuroMAB meeting, provide a special forum for sites to share their urban biosphere experience.

EuroMAB Governance – Network Facilitation, How, Who does it?
A sufficiently resourced secretariat for EuroMAB should be established to facilitate the actions above.

EuroMAB outreach and communication
Given that universities are found in cities, Urban Biosphere provides an opportunity for better links with a diverse range of research areas. More generally, we recommend that each BR should forge links with its local research community, in order to allow sound science to inform policy change.

As youth represent the sustainability of society, their involvement in biosphere activities is not only important, but essential.

Annexes

Program

ANNEX - I

EuroMAB 2007 TURKEY

Place	:	Titanic Beach Resort Hotel, Lara-Antalya
Dates	:	12-16 November 2007
Language	:	English

Time Table

Sunday, 11 November	:	Arrival of participants
Monday, 12 November	:	Plenary opening and presentations
Tuesday, 13 November	:	Parallel sessions of thematic groups
Wednesday, 14 November	:	Full day field trip
Thursday, 15 November	:	Continuation of thematic groups working, plenary and conclusion
Friday, 16 November	:	Departure of participants

PROGRAMME

Monday, 12 November

09:00-10:00 Registration

Welcome and opening session

10:00-10:15 Mahir KUCUK, Chairperson of Turkish MAB Committee

10:15-10:45 Natarajan ISHWARAN, Director Division of Ecological and Earth Sciences, MAB Secretary

10:45-11:15 Coffee break and press conference

11:15-11:35 Dr. Günter KOECK, EuroMAB Austria 2005 and follow up

11:35-12:10 Thomas ELMQVIST, Biosphere reserves as learning sites for sustainable development

12:30-14:00 Lunch

Plenary **General introduction to thematic groups and Keynote**

Presentations

14:00-14:30 Session I: How to use biosphere reserve as learning sites for sustainable development and what contributions to the UN Decade of Education for Sustainable Development?
Per OLSSON (Keynote Speaker)
Rebecca POLLOCK (Moderator)

14.30-15:00 Session II: How to enhance the capacity of biosphere reserve to mitigate/abate and adapt to climate change?
Axel VOLKORY (Keynote speaker)
Andrew BELL (Moderator)

15:00-15:30 Session III: How does zonation of a biosphere reserve contribute to sustainable development?
Catherine CIBIEN (Keynote speaker)
Zbigniew NIEWIADOMSKY (Moderator)

15:30-16:00 Discussions
16:00-16:30 Coffee break
16:30-18:30 Continuation of keynote presentations for thematic sessions

16:30-17:00 Session IV: How to better reach and capture the economic and social benefits of biosphere reserves?
Nicolas BONDIL (Keynote speaker)
Doris POKORNY (Moderator)

17:00-17:30 Session V: How can biosphere reserves deal with environmental transformations such as urbanization and in-/out migration?
Rutherford PLATT (Keynote speaker)
Azime TEZER (Moderator)

17:30-18.00 Discussions
18:30- 19:30 Poster session
18:30- 19:30 Side event: Nature and Tourism, by Stephanie ROTH
19:30-22:30 Dinner by Excellency Veysel EROGLU, Minister of Environment and Forestry

Tuesday, 13 November

09:00-11:00 Thematic groups
11:00-11:30 Coffee break
11:30-13:00 Continuation of thematic groups
13:00-14:00 Lunch
14:00-16:30 Continuation of thematic groups
16:30-17:00 Coffee break
17:00-18:30 Continuation of thematic groups
18:30-19:30 Poster session

18:30-19:30 **Side events**
Biking Across Biosphere Reserves, By Christophe NOLTE

Inspirations from World Heritage Sites around the World, by Atilla EGE

20:00-22:00 Cultural Tastes

Wednesday, 14 November

09:30-16:00 Field trips
17:00-19:00 Antalya City Tour
19:00-21:00 Dinner

Thursday, 15 November

Plenary

09:10-09:15 Refreshing Memories
09.15-09.30 Introduction to Madrid Action Plan
09.30-10.00 Session 1 Reporting / Discussion
10.00-10.30 Session 2 Reporting / Discussion
10.45-11.15 Coffee break / Family Photo
11.15-11.45 Session 3 Reporting / Discussion
11.45-12.15 Session 4 Reporting / Discussion
12.15-12.45 Session 5 Reporting / Discussion
13.00-15.00 Lunch
15:00-17:00 EuroMAB Action plan and EuroMAB contributions for the MadridConference
17:00-17:30 Coffee break
17:00-18:00 General conclusions and closure of the Meeting
19:30-22:30 Dinner by President of Turkish National Commission, Prof. Dr. Arsin AYDINURAZ, at Anadolu Park

Friday, 16 November

Departure of participants

ANNEX-II

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