Integrating conservation and sustainable use of biodiversity

Four Examples of Ecosystem Management Areas in Germany and Sweden

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Abstract

The loss of biodiversity is recognised as a tremendous threat to ecosystems, but its maintenance is challenging. One important issue is seen as decisive for its success: the integration of sustainable use and conservation of biodiversity that means to reconcile protective measures with different kinds of use. This study investigated management areas that explicitly emphasise this issue: UNESCO Man and Biosphere (MAB) Reserves that shall contribute to reconcile the conservation of biodiversity with its sustainable use and an initiative from the Swedish government called Regional Landscape Strategies that aims to find a balance between sustainable use and conservation on a landscape level. In three MAB Reserves in Germany and one Swedish county testing Regional Landscape Strategies semi-structured interviews were conducted. They aimed to detect the values and factors steering the decisions of biodiversity management and conservation as well as to identify obstacles for sustainable use, conservation and their integration in general. The interviews reveal that the connected terms and concepts can be interpreted in different ways and this exacerbates the work. Furthermore, the study detects some issues that can facilitate the integration of sustainable use and conservation of biodiversity in the respective areas and discussed their applicability on a larger scale. Examples are the establishment of a kind of forum involving local affected stakeholders and the creation of a connection point mediating the different sectors within the administration. These aspects could help to design the management of biodiversity more sustainable if they would be part of the mainstream management practises. Regarding the state of biodiversity that shall be achieved or maintained it can be mentioned that different factors and values steer the decisions; intrinsic values are underlying, but further issues seem crucial: practicability of the respective land use, aesthetic values, a high resilience of the system as well as the near-natural states.
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1 Introduction

1.1 Background

Biological diversity is fundamental for human beings but the measures for its maintenance are not self-evident (Secretariat of the Convention on Biological Diversity, 2004). Several authorities\(^1\) claimed the need to integrate as well as balance the sustainable use and the conservation of biological diversity in order to maintain it. But this is not easy to accomplish. This study shall detect both some challenges and facilities to find solutions for the integration and balance of sustainable use and conservation of biodiversities.

Basically, biological diversity means the variability among living organisms from all kind of ecosystems, which includes diversity within species, in-between species and of ecosystems (http://www.biodiv.org/\(^4\)). Other definitions underline the importance of the processes that secure the permanent functioning of ecosystems, which in turn ensure their capacity to adapt to changes (Meffe et al., 2002). Genetic diversity within species is the prerequisite for the capacity of species to adapt to environmental changes because the rate of evolutionary change is strongly dependent on the available amount of genetic diversity. Furthermore, the individual fitness decreases with a declining genetic diversity. (Meffe et al., 2002; Luck et al., 2003)

Biological diversity plays an important role in the functioning of ecosystems since it ensures the maintenance of ecosystem processes. A system’s capacity to absorb disturbances is also known as the resilience of a system. The higher the diversity within a functional group of organisms, as for example pollinators, the higher is the resilience of the entire ecosystem (Walker & Salt, 2006). Therefore, biodiversity has an enormous importance for the world’s ecosystems and thus for the humans living in them. This regards not only food, fuel, fibre and medicines but even waste recycling, production of healthy drinking water, running global biogeochemical cycles that create an aerobic atmosphere, regulation of the global and local climate, fertile soils and other ecosystem goods and services (Tilmann, 2000).

Due to the tremendous human impact through resource use in an array of manners, biodiversity declined over the last decades alarmingly (Tilman, 2000), as it is obvious in figure 1. The need to counteract this trend was recognised and one important step was the signing of the Convention on Biological Diversity (CBD), an outcome of the United Nations Conference on Environment and Development in Rio de Janeiro in 1992. The central, holistic

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\(^1\) E.g. the Convention on Biological Diversity (CBD)
principle and framework for the CBD’s actions is the Ecosystem Approach (EA), which comprises 12 principles that are summarised by 5 operational guidelines\(^2\). Principle 10 claims the search for the “appropriate balance between, and integration of conservation and sustainable use of biological diversity” (Secretariat of the Convention on Biological Diversity, 2003). The prerequisites and challenges of this request are the focal point of this thesis.

Fig 1: WWF Living Planet Index. http://www.greenfacts.org/biodiversity/biodiversity-foldout.pdf, 19.05.07

1.2 Aim of the study
As there is a need to reconcile conservation and sustainable use of biodiversity, it is my intention to identify the challenges that arise out of this request for ecosystem managers. This study gives special attention to Man- and -Biosphere Reserves or shortly Biosphere Reserves (BR), as these are model areas that incorporate the Ecosystem Approach and thereby the ambition to integrate conservation and sustainable use. Furthermore, the Swedish Environmental Protection Board initiated in 2006 the establishment of Regional Landscape Strategies for the environmental policy that amongst others shall find measures to integrate and balance sustainable use and conservation of biodiversity (Swedish Environmental Protection Board, 2001). Thus these management tools provide interesting cases to investigate my research question. I chose three Biosphere Reserves in Germany and one Swedish county to investigate the following aspects:

- What kind of challenges do the respective management areas have to meet in connection with their objective to sustainable use and conserve biodiversity?

\(^2\) see all principles in attachment 1
• Which potential do the concepts "Biosphere Reserve" and "Regional Landscape Strategy" have for the integration of sustainable use and conservation in the respective areas and in general.

2 Theoretical and conceptual background

2.1 Motivations for conservation and ecosystem management

Principle 1 of the Ecosystem Approach (EA) states that the objectives of ecosystem management are a matter of societal choice and hence shows that there is no pure scientific reasoning for nature conservation or ecosystem management (Secretariat of the Convention on Biological Diversity, 2003). Otherwise, it would be a naturalistic fallacy to draw conclusions from descriptive to prescriptive statements. An example is the assessment of empirical facts like the “rarely” occurrence of species as automatically “good in itself” (SRU 2002, p. 16). Furthermore Principle 1 of the EA declares “ecosystems should be managed for their intrinsic values and for the tangible and intangible benefits for humans” (Secretariat of the Convention on Biological Diversity, 2003 p. 8). As the objectives of management for nature’s own sake and for more instrumental values like tangible benefits for human beings can be contrary, this may lead to conflicts of interests. But choices have to be made by the responsible personnel and compromises have to be found within this complicated context.

2.2 Relation of sustainable use and conservation of biodiversity

The Convention on Biological Diversity (CBD) uses the term in-situ-conservation for the preservation of ecosystems and natural habitats and underlines the importance of maintaining viable populations of species in their natural or domestic environment. Sustainable use is understood as the use of components of biodiversity in a way and at a rate that does inhibit the long-term decline of biodiversity. The potential to satisfy the needs and ambitions of present and future generations should be maintained at the same time. (United Nations, 1993) In other words, the reproductive surplus of natural systems is the biological basis for sustainable use or harvesting. The use of biodiversity should not exceed this surplus. Suitable habitat conditions and satisfactory genetic and spatial structure of populations are further conditions that have to be assured in order to maintain biodiversity. (Hilborn et al., 1995)

Numerous studies (Young et al., 2005; Farina, 1997) show that sustainable use often can be a kind of nature conservation. This is the case when the main prerequisite demanded from the CBD definition is fulfilled: maintaining viable populations of species. Especially in cultural landscapes, the biodiversity evolved with the human land use over many centuries (German
MAB National Committee (Ed.), 2005). Grassland systems for example evolved due to human influence over a long time in Central Europe and contain a high biodiversity. But still, sustainable use and conservation are not always overlapping and can have rather different objectives. When habitats with little human impact are in focus, it is obvious that any kind of use may destroy them. It can be summarised that there are areas with emphasise on production and others on protection (Margules & Pressey, 2000) and in-between several kinds of combinations of these two can be perceived, according to the form and intensity of use.

The predominantly protective function of conservation is mostly implemented by the establishment of reserves. As Margules & Pressey (2000, p. 243) state do “existing reserve systems throughout the world contain a biased sample of biodiversity, usually that of remote places and other areas that are unsuitable for commercial activities”. Therefore, reserves alone cannot fulfill neither the predominantly protective kind of conservation nor the one based on sustainable use. Consequently, there is a need to reform the concept or design of reserves and furthermore sustainable use has to be integrated more with conservation goals. But still the existing reserves are recognised as an important part of nature conservation even in future (Bengtson et al., 2003). Biosphere Reserves and Regional Landscape Strategies are two examples included in this study that shall help to identify aspects of nature conservation and sustainable use.

2.3 **Biosphere Reserves**

Applications of the Ecosystem Approach are Man and Biosphere Reserves, which explicitly shall contribute to “reconcile the conservation of biodiversity with its sustainable use” (UNESCO-MAB, 2000). The initiative to establish such kinds of reserves came up in the 1970’s and they target the “ecological, social and economic dimensions of biodiversity loss and the reduction of this loss” (http://www.unesco.org/³). In 1995, the Seville Strategy was elaborated to make the mission and activity concept of the MAB program clearer. It describes the biosphere reserves as an important tool to find an answer to the crucial question of “How is it possible to reconcile conservation of biodiversity and biological resources with their sustainable use?” (UNESCO-MAB, 1995).

According to article 3 and 4 of the Statutory Framework of the World Network of Biosphere (2006) Reserves the selected area has to be a mosaic of ecological systems representing the typical qualities of major biogeographic regions. Furthermore, the natural conditions have to
be significant for biological diversity conservation and the area must have an appropriate size to fulfil the following basic functions:

(i) Conservation - contribute to the conservation of landscapes, ecosystems, species and genetic variation;
(ii) Development - foster economic and human development that is socio-culturally and ecologically sustainable;
(iii) Logistic support - support for demonstration projects, environmental education and training, research and monitoring related to local, regional, national and global issues of conservation and sustainable development.

(UNESCO-MAB, 2006)

The central element of MAB reserves is the zonation of the corresponding reserve area into the following scheme: a legally protected core area, a buffer zone and an outer transition area. The main goal of the core area is long-term protection and depends on the conservation targets of the respective Biosphere Reserve. The buffer zone encloses the core area and the human activities have to be consistent with the objectives in the core area. Finally the transition area is supposed to include sustainable resource management. (UNESCO-MAB, 2006)

2.4 Regional Landscape Strategies

The current Swedish environmental and conservation policy comprises several environmental quality aims, for example “a rich life of plants and animals” (translated by author, Swedish Environmental Protection Board, 2001) that consists of three sub-goals: establishment of sustainable use, diminishing the loss of biodiversity and the portion of endangered species. In the government bill some measures are proposed to implement these goals, such as landscape strategies that should be a basis for sustainable use of natural resources. Regional landscape strategies are one tool that shall integrate the measures necessary for sustainable use and conservation of biological diversity. Resources should be sustainable used in a landscape perspective. Seven counties test the Regional Landscape Strategies, starting in 2006. Sustainable use and conservation of biodiversity are seen as two sides of the same coin in the governmental bill. (Swedish Environmental Protection Board, 2001) The planning- and environment department of the nature management board of the county conducts the project (County of Västerbotten, 2006). The main national authority that is responsible is the Swedish environmental protection board, which will summarise the experiences of the seven counties in 2008. The national boards for cultural heritage (Riksantikvarieämbetet), fishing, agriculture and forestry have a supporting function. The main aims are:
• The dialog with landowners and other stakeholders shall reveal knowledge about the surrounding landscape in connection to the different parts and dimensions.
• The authorities hope to get some experiences about the possibilities to get different stakeholders involved and cooperating.
• Creating a suitable model for a dynamic and stable local organisation or council that can tackle factual issues in a responsible and sustainable manner and which the local people can rely on at the same time. (County of Västerbotten, 2006)

Obviously, the concepts of Biosphere Reserves and Regional Landscape Strategies have similar aims, but their prerequisites differ a lot. The MAB Programme is an international institution and exists for more than 30 years. Regional Landscape Strategies are a Swedish pilot project lasting around one year. Nevertheless it seems interesting to investigate their approaches and outcomes.

3 Method

3.1 Scientific approach
The study uses *inductive research*, which shall generate observations and findings into a new theory or empirical generalisations. The opposite research method is the deductive one that includes the testing of a theory. This distinction is meaningful, even though it is recognised that inductive methods include some elements of deduction and reverse. (Bryman, 2004)
Inductive research is mostly carried out by qualitative methods as for example qualitative interviews. In these the emphasis lies on the interviewees’ own perception and perspective. Therefore, the interviewer can pick up issues given by the interviewee and ask follow-up questions out of them. (Bryman 2004)

3.2 Research design and method
The method of *qualitative interviews* was chosen to be able to detect some important areas of conflict and how the reserves or management entities deal with them. Semi-structured interviews were conducted since they offer orientation through an interview guide with crucial questions and simultaneously leave space for flexible further questioning (Kvale, 1996). Also certain similar questions were asked in all interviews. The interview guides for the Biosphere reserves have two parts. The first tackles issues of the research question in connection to the Biosphere Reserve in general and the second entails questions about issues in the respective reserve area. Since the questions about the single situations in the different reserve areas vary a lot, I did not compile a pilot guide, but instead tried to include the
information received in the previous interviews into the questions for the following ones. The interview with the responsible person for the Regional Landscape Strategies is slightly different because this management strategy is in its pilot phase and lasted only about 1 year. I looked for complementary information about the areas and concepts on interest through a literature research, mainly WebPages and scientific articles.

3.3 Choice of interviewees’

Since qualitative interviews were chosen, it seemed suitable to focus on people with different backgrounds and expertise, if possible. In this way a lot of different aspects should be revealed.

- I chose to interview Dr. Doris Pokorny from the Biosphere Reserve Rhön, Germany. She has been vice manager and research coordinator of the Reserve in one federal state (Bavaria) for 16 years. Furthermore, she is a member of the German MAB-Committee and involved in the international MAB programmes. Therefore I expected particularly her to be able to assess the possibilities and deficiencies of the Biosphere Reserve Concept.

- I interviewed Stefan Woidig who has worked in the department for publicity and communication of the Rügen Biosphere Reserve for two years, Germany.

- I chose to interview Jürgen Peil from the Biosphere Reserve Schorfheide-Chorin, Germany, who has been engaged in rendering land use more ecologically for 16 years.

- I interviewed Marita Alatalo from the Swedish Environmental Protection Board who has been the person in charge for the implementation of the Regional Landscape Strategy in the county of Västerbotten, Sweden since the beginning of the project one year ago.

3.4 Accomplishment of the interviews

All four partners were interviewed via telephone and the conversation was recorded. Afterwards, I transcript the interviews while I abstained from noting pauses or exact meaning repetitions, since I did not perceive them being important for the research topic. Afterwards, the interviews were concentrated with the help of the five-step meaning condensation method proposed by Kvale (Kvale, 1996). The results were sent to the interviewees and commented if necessary in order to avoid misunderstandings. The condensed versions of the interviews were translated into English.
3.5 Choice of the MAB reserves

The three chosen MAB reserves do not represent all types of biosphere reserves in Germany or MAB reserves in general. But the social-ecological prerequisites and main management activities differ to a certain extent and therefore cover a broad range of ecosystems and their management practices. The following short characterisation will show that the natural conditions vary from lowlands at the Baltic Sea in the north-east (MAB reserve Süd-Ost Rügen) and postglacial lowlands in the eastern part of Germany (MAB reserve Schorfheide-Chorin) to a lower mountain range in the middle of Germany (MAB reserve Rhön). Naturally, the management efforts overlap to a certain extent as sustainable land use is the determining aim, but the focal points vary for example from environmentally friendly design of tourism in the Rügen Biosphere reserve to grazing projects in the lower uplands of the Rhön Biosphere Reserve.

The UNESCO designated all three MAB reserves in the beginning of the 1990’s, which is very suitable for the investigation. According to Article 9 of the Statutory Framework of the World Network of Biosphere Reserves (2006), all MAB reserve authorities are supposed to compile a periodic review of their work every ten years (UNESCO-MAB, 2006). Due to the similar age of the three MAB reserves, they all are evaluated once. The basic points to tackle in this periodic review are the main requirements for the establishment of a reserve, summarised in Article 4 of the Statutory Framework (UNESCO-MAB, 2002). Since the corresponding authorities have to report amongst others ecological facts as well as human activities, the evaluation documents were a good starting point for the identification of possible solutions for the balance between sustainable use and conservation of nature, (UNESCO-MAB, 2002). These reports should contain for example habitats and characteristic species with significance for conservation of biological diversity as well as relevant habitat management practices and information about resource use or tourism activities. The reports were very helpful for the compilation of the interview guides.

3.6 Choice of the example county for Regional Landscape Strategies

Due to time limitations, I was only able to look closer on one of the seven Swedish pilot counties testing Regional Landscape Strategies. I chose the county of Västerbotten, Sweden, because I informed myself during previous work about parts of this county and furthermore got the information that Västerbotten achieved a fairly success in this short time period.
3.7 Social-ecological characterisation of the chosen management areas

3.7.1 Biosphere Reserve Schorfheide-Chorin, Germany

The MAB reserve “Schorfheide Chorin” is situated in the federal state Brandenburg in the north of Berlin and represents postglacial lowlands with all characteristic geomorphologic features. (www.unesco.org/) It covers an area of around 130.000 ha, nearly half of it represented by forest (65.298 ha), followed by 37.654 ha of fields and 12.672 ha of grassland. The reserve lies in the transition area of maritime and subcontinental climate and is characterised by a very low precipitation compared to other regions in Germany (<500-560mm). The determining human activities are agriculture, forestry and freshwater fishery. Current ecological problems are a very high percentage of game animals and the abandonment of land use in special biotopes like dry grassland. Furthermore, lakes for fishing risk to degrade, because discharging and extra feeding are common fishing methods that leading to nutrient enrichment. (http://www.schorfheide-chorin.de/) The potential natural vegetation are mixed temperate oak, beech and pine forests and dry grasslands; dominating landscape elements are lakes, ponds, rivers and mires of different hydrological origin (http://www.unesco.org/1). More than 2000 mires can be found in the reserve, which corresponds to 10% of the whole reserve area, unfortunately many of them are degraded (http://www.schorfheide-chorin.de/).

3.7.2 Biosphere Reserve Rhön, Germany

The MAB reserve Rhön spans over 184.939 ha in the middle of Germany and is managed by three federal states. Montane and sub-montane humid grasslands on siliceous soils are dominant landscape elements in the otherwise temperate broad-leaf forest. The low mountain range was hardly influenced by the ice ages and this is one reason, why there are only two bogs in the whole area. The climate shows relatively cold mean temperatures (around 7°) and therefore only grazing activity is a possible land use in areas above 600 m altitude (http://www.biosphaerenreservat-rhoen.de/). The grazing activities cause the open landscape, which is an exception in German low mountain ranges. The motto of the Rhön Biosphere Reserve is "A future to nature - new chances to humans" and comprises for example aims like “Conserving cultural landscapes through sustainable land use” and “Conserving and enjoying nature” (http://www.biosphaerenreservat-rhoen.de/). The MAB reserve Rhön is the first one in Germany that established a framework plan both for research and management in the future (http://www.biosphaerenreservat-rhoen.de/).
3.7.3 **Biosphere Reserve Südost-Rügen, Germany**

The MAB reserve “Süd-Ost-Rügen” is located on Germany’s biggest island Rügen and extends an area of 22,800 ha, half of it covered by water. Fields, grassland and forests characterise the terrestrial area. The impacts of the last glaciations are dominating the landscape with ground and terminal moraine hills and shallow bays. Pine and beech forests, pastures and grasslands dominate the terrestrial vegetation, typical coastal vegetation can be found in the brackish water. The main human activities are fishing, agriculture and tourism. The main challenges the area has to cope with are the high unemployment in the region and increasing car traffic in the holiday season that may impair the establishment of sustainable land use. ([http://www.unesco.org/](http://www.unesco.org/), [http://www.biosphaerenreservat-suedostruegen.de/](http://www.biosphaerenreservat-suedostruegen.de/))

3.7.4 **Regional Landscape Strategies – County of Västerbotten, Sweden**

The County administration of Västerbotten decided to implement the Regional Landscape Strategies in a part of the county, a mountainous region in southern Västerbotten Mountains. It comprises 150,000 ha in the north-western part of the Vilhelmina parish, the valley of lake Kultsjö. The overall aim confirmed in the project plan is to create a kind of natural meeting place, a mountain council for all stakeholders in the mountain region that use resources in different ways or are affected by its use. This new forum shall allow the application of Regional Landscape Strategies. (County of Västerbotten, 2006)

3.8 **Method constraints**

I wanted to find out issues related to the integration of sustainable use and conservation of biodiversity and chose the institutions Biosphere Reserves and Landscape Strategy to assess the challenges related to these issues. I perceive the interviewing of responsible personnel of Biosphere Reserves both as suitable for the investigation of the research question and biased to a certain extent. This is the case because the interviewees both are familiar with the concrete activities and problems and at the same time they might have difficulties to assess the Biosphere Reserve concept impartially. I compiled three interviews in my mother tongue and one in a foreign language. It seems obvious that the risk of misunderstanding or misinterpretation is much higher in the case of a foreign language and possibly tampers the results. Further constraints might be that all investigated MAB Reserves are situated in Germany and the four research areas are within the European Union. Since Biosphere Reserves have to fulfil special prerequisites in order to get designated, they have an easier starting point to cope with the challenges connected to sustainable use. Therefore it might be difficult to apply strategies to non-protected areas.
4 Results and Analysis

The condensed interviews are attached and the surnames used as references in the text.

4.1 Obstacles to reconcile conservation and sustainable use of biodiversity

4.1.1 Understanding of terms

First of all, it was noticeable that the understanding of the terms sustainable use, conservation and biodiversity varies among the interviewees and some discern it as difficult to find a meaningful definition at all. All interviewees recognised that biodiversity increased over centuries due to human activity in the agricultural and forestry sector, especially in central Europe. In other words, there are some few natural habitats that should not be used at all and cultural habitats (that maybe are called natural habitats) that humans have to use in order to maintain them. Therefore, the integration of use and conservation is seen as the only way to maintain this biodiversity. Beyond this, islands of wilderness shall be maintained and integrated in a well connected biotope network (Pokorny).

Biodiversity is not seen as the only subject of conservation activities, abiotic goods like water, soil and air are perceived as important as biodiversity itself. Furthermore, biodiversity is difficult to calculate and alters a lot due to natural variations as for example the ratio between pests and beneficial organisms (Peil). In addition, time dimensions exacerbate the identification of preserving measures suitable for biodiversity, because species can disappear due to other reasons than land use. Although the term biodiversity is connected both with species in natural habitats and with synanthropic species or “existing biodiversity” (Peil), such artificial habitats like pine monocultures shall not be included into the understanding of biodiversity according to one interviewee (Peil).

Some interviewees wonder whether sustainable use in agriculture can be achieved only through organic farming (Peil, Pokorny). One interviewee stated that even small-scale non-organic farming can be sustainable, especially in marginal-profit regions. At least the effect on the landscape can be fairly the same, even though organic farming is described as exemplary (Pokorny). Furthermore, the expression “to reconcile conservation with its sustainable use” is criticised. An alternative proposal is “conservation of biodiversity through non-use and sustainable use” (Peil), while there is a gradient from sustainable, economically profitable use to pure artificial protection measures (e.g. maintenance of dry meadows through clearing bushes by hand).
4.1.2 External background

The interviews reveal that Biosphere Reserves or areas managed according to Regional Landscape Strategies are not independent islands, but rather integrated in the public context. The political background in the European Union (EU) as well as on the national and regional level is marked as decisive for the work in the several areas. This is especially the case in agricultural and nature conservation policies (Alatalo, Pokorny, Peil, Alatalo). The agricultural subsidies determine the possibilities to modify land use and thus can be a challenge for sustainable land use and conservation. International treaties, EU-directives as well as laws of national and federal states strongly determine the decisions in the nature conservation sector, too. The corresponding species composition or habitat qualities shall automatically lead to a certain status of protection, for example through management plans.

Sectoral administration is further identified as an obstacle for the implementation of sustainable use by all interviewees. This is observed as a hinder to see all the values of a landscape (Alatalo).

4.1.3 Specific/actual background and conflicts

According to the interviewees, the influence of Biosphere Reserves depends heavily on their acceptance by the local population. Since managers in Biosphere Reserves want to encourage local stakeholders to participate in decision-making, the attitude of these people is pivotal. Most conflicts with conservation and/or sustainable use in general arise out of direct land use like agriculture or forestry and free time activities such as sports, fishing or aviation (Pokorny). Legally protected reserves are appreciated as a proper instrument to find compromises between the different interest groups. Namely, in the case of leisure activities, nature reserves are the only possibility in Germany to constrict the citizens’ right to enter the landscape (Pokorny). The impacts of tourism and free time activities are estimated different in the single investigated areas. The Biosphere Reserve Rhön has to cope with different interests from aviation and skiing activities that affect adversely sensible areas, for example. The interviewee of the Biosphere Reserve Rügen instead detects the greatest threat in individual traffic. Furthermore, urban sprawl is recognised as a problem in all three MAB reserves.

Agriculture accounts for a large part of human impact on biodiversity and represents both threats and benefits for biodiversity conservation, depending on the form and intensity of land use. For example, the EU-Habitat-Directive demands the establishment of Special Areas of Conservation (SPC) and the EU-Birds-Directive demands the creation of Special Protected Areas (SPA). Together they shall help to build the NATURA 2000 network, providing habitats (wintering, migrating and constantly used) for rare and endangered plant and animal species. (http://www.natura.org/about.html, 19.05.2007)
use. The abandonment of land use especially in marginal profit areas is a problem that leads to loss of habitats and “cultural” biodiversity. The promotion of conservation measures in this sector is one effort of national and international policy, but the interviewees revealed that it is a “challenge to convince farmers” (Woidig) to use these offers or even that a “special attitude of life” (Woidig) is necessary to pay attention to these issues. It was presumed that a certain connection to the homeland might be facilitating (Peil). Regarding the forestry sector, conversion of forests similar to plantations into mixed forests is recognised as important. In several regions the responsible agencies make efforts to put this into action. Simultaneously, an interviewee underlined the importance of continuous awareness building about the benefits of mixed forests, because economic tough times can lead to a shift in management practices in favour for short-term profit solutions like pine monocultures (Peil).

In relation to the question about conflicts between protective conservation and sustainable use, the interviewees declared that the genuine emphasis of a Biosphere Reserve lies on the buffer or development zone. Therefore sustainable use and not protective nature conservation is the focal point for them. A quite contradictive issue regarding protective conservation was brought up by the interviewee of the Biosphere Reserve Schorfheide Chorin. The core areas covered by forest are under strict protection, but due to a human induced high game percentage in the surrounding 4, a natural development of the protected areas was impossible without some hunting activity.

Renewable energies are a critical theme in some of the investigated regions. Although they are thought to represent a sustainable form of energy production, they can adversely affect the state of nature and carry along unsustainable forms of land use. This is particularly the case, when biomass cultivation for bioethanol production leads to the establishment of monocultures and hence irrigation activities that can have negative effects on the groundwater level. Since the Biosphere Reserve Schorfheide-Chorin is situated in a very dry region, this is a serious danger there. In addition wind power is controversial, because it can disfigure the natural scenery and impair the quality of the habitat. One example is a wind park planned in the mountain region of Västerbotten, which would destroy a suitable grazing area for reindeer. Furthermore, waterpower and mining in the mountainous regions of Västerbotten are perceived as a threat to biodiversity through the destruction of existing habitats.

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4 The area was used as a hunting territory by the political leaders in the GDR.
4.2 The concepts “Biosphere Reserve” and “Regional Landscape Strategies”
In this paragraph some issues regarding the two concepts “Biosphere Reserve” and “Regional Landscape Strategies” and how they can facilitate the integration of conservation and sustainable use are tackled. The establishment of a forum is apprised from all interviewees as a striking issue to mitigate possible and existing conflicts between different interest groups. Thereby, the risk of unsustainable use and the threat of biodiversity loss can be eased (Pokorny, Woidig, Alatalo). The Biosphere Reserve concept demands the elaboration of a vision or management concept and in the ideal case several actors and local stakeholders are gathered to assess important issues of use and conservation in the reserve area. Similarly, the main point of the Regional Landscape Strategies is to establish a kind of council that can foster the cooperation of stakeholders. By use of the bottom-up approach in both Regional Landscape Strategies and Biosphere Reserves, a more sustainable form of regional development is supposed to take place (Pokorny, Alatalo). Furthermore, the compulsory zonation of Biosphere Reserves into core, buffer and transition areas determines the ratio between areas emphasising protective conservation and human dominated areas. The respective interviewees seized this as an important and meaningful instrument to reconcile sustainable use and conservation of biodiversity (Peil, Woidig).

In several cases, the work of Biosphere Reserves could help to create solutions that are more convenient regarding the maintenance of the current landscape. For example, urban sprawl in the Biosphere Reserve Schorfheide could be mitigated thanks to an initiative of registering craft- and industry territory in the rural areas (Peil). Thus unnecessary exploitation of new areas and further fragmentation could be avoided. Regarding the mediation of free time activities, a Mountain-bike plan in the Biosphere Reserve Rhön could help to adjust free time sports and conservation interests. This is a further form of spatial and temporal differentiated solution that reconciles different kinds of use such as tourism, sports and conservation (Pokorny).

To foster regional marketing measures is perceived as an important instrument to enhance both the dedication of gastronomy and food processing branches. This is seen as a prerequisite for sustainable development. The model character of Biosphere Reserves allows the testing of new forms of sustainable use, which otherwise would be hard to implement due to usually risky conditions in the beginning. Biosphere Reserves need model funding in order to be able to fulfil their function as model area (Peil).
4.3 Possible factors steering the definition of conservation aims

Concerning biodiversity it is important to know that the character of a landscape can vary between situations close to the natural conditions and highly modified cultural landscapes according to the intensity of human impact (Young et al., 2005). In theory, all states are included in the concept of biodiversity. Consequently, it is a decisive question which state of biodiversity shall be maintained. It was the aim of the study to find out, what the determining motivations and values regarding the management objectives are for the respective decision makers.

4.3.1 Intrinsic values

Despite the term biodiversity is connected with both species in natural habitats and synanthropic species or “existing biodiversity”, there seems to be a limit because pine monocultures shall not be included into the conception of biodiversity according to an interviewee (Peil). Here, the low amount of species was one point that leads to the exclusion from biodiversity. This seems to be a naturalistic fallacy since biodiversity as scientific concept without any valuation includes the amount of species, their genetic diversity and the variety of communities (Meffe et al., 2002). Consequently, the exclusion of natural habitats or species from this concept is difficult or at least should be motivated. A further point stated in this interview was that if pine monocultures are included in the concept of biodiversity, consequently neither genetically modified organisms (GMO) nor possible mutations between GMO’s and other species could be excluded. And this seems very contradictory to the interviewee. Therefore it could be presume that intrinsic values play only a limited role in decision making and instead other issues, as the following, might be more decisive:

- Practicability of the respective kind of use
- A possibly high biodiversity in order to enhance the resilience of the system
- A status possibly closed to the potential natural conditions.

4.3.2 Practicability

The assumption that practicability plays a role for the decision was approved to some extent in the interviews because “realistic solutions” (Peil) of agricultural design are assessed as important. The promotion of land use techniques from the Middle Ages with their resulting biodiversity is not appraised as meaningful. Therefore, it can be supposed that the economical feasibility is steering this question, too. In fact one interviewee understood “sustainable use of biodiversity” as a use that has to be economically profitable. The cultivation of old apple species and their advantageous marketing was one example stated. But in this case it is
arguable to which extent these aspects should be decisive for the identification of the state of biodiversity that should be maintained.

### 4.3.3 Resilience or near-natural states

In the case of pine monocultures for example, negative effects on the water household were named (Peil) and thus it can be suspected that a preferably high resilience of the system plays an important role, too. Even aesthetic values seem to be connected since the recreational value of a pine monoculture is not experienced as high, for example. Here, aesthetic values and the ecological function in the landscape appear more important than intrinsic values. These qualities are given in a system that is closer to the natural conditions, in this case a mixed forest. Since the responsible authorities strive for these states, one could presume that a status that mimics potential natural conditions is preferred in general. Yet, it seems too easy to say it like this. Due to the fact that pastures are not closed to the natural conditions but definitely estimated as worth to save, near-natural conditions cannot be the only or most decisive factor. In this case, aesthetic values seem more important.

### 5 Discussion

#### 5.1 General issues facilitating the integration of sustainable use and conservation

As people have competing goals concerning the use of landscapes, conflicts are inevitable. But the experiences in the management areas investigated in this paper show that some issues can facilitate this situation. For example, the existence of a kind of forum was detected as helpful by all interviewees as it was discussed in paragraph 4.2. The question to which extent this organisation form can be applied on a larger scale is very interesting, but cannot be fully answered in this paper.

#### 5.1.1 Overcoming sectoral administration

Overcoming the current sectoral administration is connected to the issue of creating a kind of forum. Division of responsibilities is a necessary fact in modern societies, but the establishment of such a connecting point between the single authorities that have influence on the management of natural resources is proposed as a suitable solution. The quality of the demanded administrative connecting point shall be similar to the ones in the investigated areas. To be exact, these offices should have a rather coordinating than managing function, but should not be a further, fairly independent administrative authority. Biosphere Reserve leaderships often are seen as coordinators rather than managers (Bioret 2001) and Regional Landscape Strategies emphasise the importance of councils of local people and other
measures, but do not intend to establish another managing authority either (County of Västerbotten, 2006). The possibility to adopt elements of the Biosphere Reserves into the mainstream administration is heavily doubted by the respective interviewees. On the other hand, the initiative of the Regional Landscape Strategies shows that there are possibilities to implement this sort of connection point. Hopefully other countries will learn from this Swedish initiative.

The question of scale is important as well. One interviewee noted that this coordination point should be established at least on the county level. Comparing German and Swedish counties makes it obvious that this can be a large term. The County of Rügen, where the Biosphere Reserve Rügen is situated extends over 974 km$^2$ (http://www.kreis-rueg.de/), whereas the county of Västerbotten covers around 5928 km$^2$ (http://www.regionfakta.com/7). Surely, the population density differs a lot. But nevertheless it remains an open question to find an appropriate size for the management areas. Still it seems crucial for the entities to be able to stay in contact at least with the representatives of most involved stakeholders and to establish relations of confidence. Probably, the existing structures are too large, although their size might be suitable for other subjects. This resembles the paradox of efficiency (too big administration entities in this case) that can lead to a decreased resilience even in social systems (Walter & Salt 2006). Here this might be due to the lack of trust and cooperation among the local stakeholders.

Connected to the possibly intersectoral working administration is the issues of spatial and temporal differentiated planning that may facilitate the integration of sustainable use and conservation; it was discussed in paragraph 4.2. It is especially well-working, when the problems are detected “in advance” as it was done for the mountain-bike plan in the Biosphere Reserve Rhön. Obviously, the success of administrative bodies can depend on their size and how they can cooperate with representatives of local stakeholders.

5.1.2 Zonation

The zonation of Biosphere Reserves according to the different functions of the landscape is stressed as a suitable method to reconcile conservation and sustainable use of biodiversity by the respective interviewees. This is hardly possible to implement on a large scale in this form. Furthermore, Biosphere Reserves contain areas worth to be strictly protected by definition, otherwise they do not fulfil the prerequisites for their designation (UNESCO-MAB 2006). But nevertheless, the element of spatial division and allocation of different purposes to areas seems worth to adopt into general administration and may help to balance sustainable use and
conservation of biodiversity. Naturally, this partly happens already; there is an array of planning forms on all administrative levels. But the deficiencies visible in the loss of biodiversity reveal that these planning efforts are not sufficient.

5.2 Final question - How to find a balance?

The understanding of biodiversity and the resulting decision which kind of biodiversity is worth to maintain determinates the relation between sustainable use and conservation of biodiversity. All connected terms were assessed as complicated by the interviewees. Naturally this exacerbates the work to integrate sustainable use and conservation of biodiversity. The CBD demands regarding sustainable use of biodiversity the maintenance of populations in a way that guarantees their long-term survival. But this leaves space for a lot of interpretations; how precautionary shall the managers act, for example? How shall they deal with change, this main rule in natural systems (Walker et al., 2006)? Regarding sustainable use in agriculture, for example, this study reveals that there are different opinions about the impacts of different kinds of land use. Investigations in one Biosphere Reserve showed that large-scale organic farming can have more negative effects regarding species conservation than a small-scale conventional working farm (Peil)\(^5\). But maybe, if the status of the abiotic goods is included in the assessment, as demanded by one interviewee, the result would be different. To sum it up, the suitable form of land use that is sustainable regarding the maintenance of biodiversity and resilience of the system is difficult to find. There are several aspects influencing the impact on the landscape.

Concerning the gradient between strong protective conservation measures and sustainable use it seems obvious that first of all any kind of direct land use should be designed as sustainable as possible. It can be presumed that it might be more important to have a possibly high average resilience than to have a lot of biodiversity hot spots (Jepson & Canney, 2001). This is supported by the fact that maximising the biodiversity is not the only requirement for a high resilience within an area. For example, the maintenance of mobile link organisms is recognised as a further prerequisite for the protection of resilience (Lundberg & Moberg, 2003). Moreover, the size and quality of a population can be very decisive for the continuance of ecosystem functioning and thus its resilience. The resulting measures necessary for the further supply with ecosystem services can differ from the ones concentrated on species conservation. (Luck et al., 2003) According to Luck et al., the inclusion of population

\(^5\) In this case, the width of the machines used in the large-scale organic enterprise pose a threat to skylarks in fields, for example. This impact is less dangerous in the case of small-scale conventional working farms.
diversity requires more attention for the successful conservation of biodiversity. Hence it seems crucial to include the aspects of mobile link species and population qualities into conservation policy. Since the maximisation of biodiversity in number of species is not the main aim, it shall rather be a measure to reach a possibly high resilience and thereby a constantly supply of ecosystem services. Surely, the uncertainty of the effects of certain management measures on ecosystem services is exacerbating the situation (Bennet et al., 2005), but just because of this, a careful assessment of biodiversity conservation in connection to the supply of ecosystem services seems inevitable.

To reconcile protective and use-based measures, current concepts often demand a kind of plausible orientation size (SRU, 2002). In the case of Biosphere Reserves, a core area of 3% is obligatory. This size is not explicitly claimed to be neither the minimum nor the most suitable size to secure biodiversity conservation. As one interviewee stated, the demand of one connected, not fragmented area would be more meaningful than a fixed size of 3% (Pokorny), since these habitats provide better possibilities for biodiversity conservation (Bengtsson et al., 2003). It seems meaningful to think about, if the demand of fixed sizes of special areas are adequate or should be complemented by qualities like connectivity, for example. Regarding the state of biodiversity or cultural landscape that shall be maintained, it should be focused rather on a possibly high resilience within the system than to example on aesthetic issues, if these are opposing issues in a case, because this might provide a higher chance for biodiversity conservation and the further capacity of the supply with ecosystem services in the long run.

6 Conclusion

As this study reveals, the integration of conservation and sustainable use of biodiversity is far from easy. The connected terms and concepts can be interpreted in different ways and this can be an obstacle. Furthermore biodiversity conservation depends on decisions from all scales of civilisation, from single preservation actions to the framework established by European agricultural policy. Additionally, different factors steer the decisions which kind of biodiversity shall be maintained. Intrinsic values are underlying, but further issues seem crucial: practicability of the respective land use, aesthetic values, a high resilience of the system as well as near-natural states. The work in the Biosphere Reserves or with the Regional Strategies offers some facilitation for the integration of sustainable use and conservation of biodiversity. The establishment of a kind of forum can secure a better cooperation of local stakeholders and mitigate existing conflicts. A kind of connection point
for the different parts of administration connected to the use and conservation of biodiversity can help to see the landscape as a whole and facilitate the establishment of sustainable solutions. Finally, an emphasis on near-natural systems with a high resilience seems to be suitable for the integration of sustainable use and conservation of biodiversity.
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Attachments

Attachment 1 – Principles of the Ecosystem Approach

Principle 1: The objectives of management of land, water and living resources are a matter of societal choices.
Different sectors of society view ecosystems in terms of their own economic, cultural and society needs. Indigenous peoples and other local communities living on the land are important stakeholders and their rights and interests should be recognised. Both cultural and biological diversity are central components of the ecosystem approach, and management should take this into account. Societal choices should be expressed as clearly as possible. Ecosystems should be managed for their intrinsic values and for the tangible or intangible benefits for humans, in a fair and equitable way.

Principle 2: Management should be decentralised to the lowest appropriate level.
Decentralised systems may lead to greater efficiency, effectiveness and equity. Management should involve all stakeholders and balance local interests with the wider public interest. The closer management is to the ecosystem, the greater the responsibility, ownership, accountability, participation, and use of local knowledge.

Principle 3: Ecosystem managers should consider the effects (actual or potential) of their activities on adjacent and other ecosystems.
Management interventions in ecosystems often have unknown or unpredictable effects on other ecosystems; therefore, possible impacts need careful consideration and analysis. This may require new arrangements or ways of organisation for institutions involved in decisionmaking to make, if necessary, appropriate compromises.

Principle 4: Recognising potential gains from management, there is usually a need to understand and manage the ecosystem in an economic context. Any such ecosystem management programme should:
a) Reduce those market distortions that adversely affect biological diversity;
b) Align incentives to promote biodiversity conservation and sustainable use;
c) Internalise costs and benefits in the given ecosystem to the extent feasible.
The greatest threat to biological diversity lies in its replacement by alternative systems of land use. This often arises through market distortions, which undervalue natural systems and populations and provide perverse incentives and subsidies to favour the conversion of land to less diverse systems.
Often those who benefit from conservation do not pay the costs associated with conservation and, similarly, those who generate environmental costs (e.g. pollution) escape responsibility. Alignment of incentives allows those who control the resource to benefit and ensures that those who generate environmental costs will pay.

Principle 5: Conservation of ecosystem structure and functioning, in order to maintain ecosystem services, should be a priority target of the ecosystem approach.
Ecosystem functioning and resilience depends on a dynamic relationship within species, among species and between species and their abiotic environment, as well as the physical and chemical interactions within the environment. The conservation and, where appropriate, restoration of these interactions and processes is of greater significance for the long-term maintained conditions and, accordingly, management should be appropriately cautious.
Principle 6: Ecosystem must be managed within the limits of their functioning.
In considering the likelihood or ease of attaining the management objectives, attention should be given to the environmental conditions that limit natural productivity, ecosystem structure, functioning and diversity. The limits to ecosystem functioning may be affected to different degrees by temporary, unpredictable or artificially maintained conditions and, accordingly, management should be appropriately cautious.

Principle 7: The ecosystem approach should be undertaken at the appropriate spatial and temporal scales.
The approach should be bounded by spatial and temporal scales that are appropriate to the objectives. Boundaries for management will be defined operationally by users, managers, scientists and indigenous and local peoples. Connectivity between areas should be promoted where necessary. The ecosystem approach is based upon the hierarchical nature of biological diversity characterised by the interaction and integration of genes, species and ecosystems.

Principle 8: Recognising the varying temporal scales and lag-effects that characterise ecosystem processes, objectives for ecosystem management should be set for the long term.
Ecosystem processes are characterised by varying temporal scales and lag-effects. This inherently conflicts with the tendency of humans to favour short-term gains and immediate benefits over future ones.

Principle 9: Management must recognise the change is inevitable.
Ecosystems change, including species composition and population abundance. Hence, management should adapt to the changes. Apart from their inherent dynamics of change, ecosystems are beset by a complex of uncertainties and potential "surprises" in the human, biological and environmental realms. Traditional disturbance regimes may be important for ecosystem structure and functioning, and may need to be maintained or restored. The ecosystem approach must utilise adaptive management in order to anticipate and cater for such changes and events and should be cautious in making any decision that may foreclose options, but, at the same time, consider mitigating actions to cope with long-term changes such as climate change.

Principle 10: The ecosystem approach should seek the appropriate balance between, and integration of, conservation and use of biological diversity.
Biological diversity is critical both for its intrinsic value and because of the key role it plays in providing the ecosystem and other services upon which we all ultimately depend. There has been a tendency in the past to manage components of biological diversity either as protected or non-protected. There is a need for a shift to more flexible situations, where conservation and use are seen in context and the full range of measures is applied in a continuum from strictly protected to human-made ecosystems.

Principle 11: The ecosystem approach should consider all forms of relevant information, including scientific and indigenous and local knowledge, innovations and practices.
Information from all sources is critical to arriving at effective ecosystem management strategies. A much better knowledge of ecosystem functions and the impact of human use is desirable. All relevant information from any concerned area should be shared with all stakeholders and actors, taking into account, inter alia, any decision to be taken under Article 8(j) of the Convention on Biological Diversity. Assumptions behind proposed management decisions should be made explicit and checked against available knowledge and views of stakeholders.
**Principle 12: The ecosystem approach should involve all relevant sectors of society and scientific disciplines.**

Most problems of biological-diversity management are complex, with many interactions, side effects and implications, and therefore should involve the necessary expertise and stakeholders at the local, national, regional and international level, as appropriate.

Source:
(http://www.biodiv.org/programmes/crosscutting/ecosystem/principles.asp)
Attachment 2 - Interviewee: Marita Alatalo

**Interview guide - Conservation and sustainable use of biodiversity**

Management area: Västerbotten, Regional Landscape Strategies

- **How long do you work in connection with nature conservation/ sustainable use and Regional Landscape Strategies?**

I am social scientist from the beginning and worked with physical planning on the local and national level for 10 years. Then I worked as a teacher at the Umeå University in connection with resource use. This means that the use has to be adopted to the society and the social development. Later on I worked with subjects concerning tourism as for example the possibilities to utilise forests, fishery and hunting not only with a production aim but also as a recreation source within tourism. Than I worked as a consult in connection with the development of the countryside.

Afterwards I started to work with Regional Landscape Strategies and could use all the skills I received in my earlier job and education experiences. Regional Landscape Strategies are a governmental instruction and seven counties should test it now. The project started in 2006 and continues until December 2007. For this time I have worked with Regional Landscape Strategies. I did not work directly with nature conservation, but my background is shaped by sustainable use. To work in connection with Regional Landscape Strategies is a very interesting job since the different values of the landscape are incorporated and you can work with the term sustainability in a very ample context.

- **It is written in the project plan for the Regional Landscape Strategies of the county Västerbotten that the “ambition should be to find a good balance between aspects of conservation and use of natural resources” (translation by author). How do you define the terms sustainable use and conservation, how would you assess their relation?**

**Conservation**

Certain natural areas should be treated in the literally understanding of the term conservation that means they should not be used at all. The original environment is decisive in these cases. Whereas some natural areas are actually cultural landscapes even though they are called ”natural habitats”. For conserving them, they have to be used. The mountainous region of the pilot area here is called a natural environment but it is a cultural environment like others because reindeer husbandry is going on there. It is very difficult to distinguish between conservation and non-conservation because a lot of different aspects have to be included.

**Sustainable use**

The term sustainable use is utilised according to the international understanding. This means that resources have to be treated in a long perspective and the future generations have to be taken into account. The resources should not be depleted but used within the borders that make possible a continuos utilisation. Economical, social and cultural perspectives are important.

- **Forestry is an economic branch with high relevance for sustainable use and conservation. How do you assess the integration of these two aspects? What are the important arguments in the debate in Västerbotten?**
In the mountainous region nearby, forestry is conducted but in a certain manner. Special methods are used that are adapted to the production capacity of the forest. The forests are both conserved and sustainable used. Naturally, there are also some negative examples.

Reserves
In the territory of the valley Kultsjödalen, there are three nature reserves, one of them shall be expanded to a national park. But in reserves there is not conducted forestry since they are preserved for their "primeval forest character".

There are identified the following areas of conflict in the project plan: expansion of water power plants, mining and wind power plants. What are the difficulties to integrate sustainable use and conservation in these aspects? How could the model Regional Landscape Strategies help to mitigate the conflicts?

Expansion of water power plants
In the respective area, there is one river (Ångermanälv) adjusted for the production of electricity by water power. A new project that plans to lead over water from a stream to a lake causes discussions since the representatives of fishing and nature conservation claim that this project will affect adversely their interests. Exploitation is in conflict with sustainable use and conservation in this case.

Mining
The mine "Stekenjokkgruvan" up in the mountains shall be open again after it was in use for 10 years. The reason is the rising price for minerals that makes it meaningful to open up the mine again. Furthermore, there are found new metalliferous veins. But this territory is very important for the reindeer husbandry since the grazing areas are very suitable and furthermore pristine mountainous regions are close to the mine.

Wind power
There are three wind power plants in the mountainous region of Klimpfjäll and now a Norwegian enterprise wants to install 40 wind power plants in the area of the Stekenjokkplatå. The representatives of the reindeer husbandry again think that this area is very important for their activity and reject the establishment of further wind power plants. Moreover there is the opinion that wind power plants do not fit at all into a mountainous region. This is an example for direct conflicts between sustainable use, conservation and exploitation. At the same time there is a will to create new jobs in this area with big problems of unemployment.

The work with Regional Landscape Strategies aims to create a mountain council and this happened in close cooperation with the local stakeholders. They can be summoned like a consultation body if there are problems with exploitations, for example. They can discuss and exchange experiences there. This activity creates a higher level of knowledge and includes a lot of perspectives. It becomes a forum for dialogues that are important to find compromises and enhances a long-term thinking for the future. The expectations for the mountain council are that various aspects, many experiences and different knowledge is included.

The mountain council has not yet started to work but many think that it would have been great if the council had been existed already. Than it would have been helpful regarding the establishment of different power plants etc. Moreover, it would be a pity if the initiative finishes with the end of the projects in 2007. Hopefully there will be powers that implement the initial work that will be done until than.
An interactive organisation form is used in the project, which shall reveal the opinions of the local stakeholders about sustainable use and conservation of natural resources. How can these forms of organisation help to find a balance between sustainable use and conservation?

Even though the mountain council is not fully implemented yet, it could help to find compromises between sustainable use and conservation. For example, the enterprise intending to open the "Stekenjokk" mine again contacted me and asked for a list of the local stakeholders. The enterprise wanted to call them for consultation and could invite the interested people thanks to the work of the mountain council done hitherto. Furthermore, the mountain region of the "Njakafjäll" is a nature reserve and at the same time a NATURA 2000 area to which a conservation or management plan has to be elaborated. For this task the network build thanks to the mountain council could help to fulfil this task and acted like a referral authority.

Which role play Local Ecological Knowledge for the identification of suitable intensities of use?

There is much knowledge among the local people, but they probably would not call it "Local Ecological Knowledge" despite they think quite ecologically. You have to be careful with the terms you use. It is their way of life that is decisive for their understanding of ecology. Sadly, there is a lot of knowledge that disappears if their is no dialogue with the local population when decisions have to be done regarding land use, for example. Their ecological knowledge is based on their way of life. People have pets, they fish, hunt and may have reindeers; they live in nature. Indeed, the exploiters come from outside but at the same time they offer jobs for the local population.

Some people think that is a higher aim to be able to live in the mountainous area than to focus on sustainable use and conservation. This is the reality we live in. Without doubt the people in the area will use the land in a sustainable manner, but aspects of survival are more important for them sometimes. Planning is a subject with a lot of dimensions and ecological knowledge is used. But sadly there are no particularly elaborated forms that can facilitate the use of this knowledge and for the cooperation with local people and other stakeholders. Deficit of time may be one reason, but it has to be tried to include the society more in planning processes.

How important is the concept of ecological thresholds? Are the stakeholders aware of this concept? Ecological thresholds are slowly changing variables as for example the amount of phosphorus in a lake. If the threshold is passed, it can be very difficult to return to the previous state since the ecological conditions changed totally.

The local stakeholders represent everything starting from nature conservation, economy, reindeer husbandry, forestry, unions of different interests and villages etc. Among some of these, there are certainly several people that have this kind of knowledge. Especially the representatives of forestry and nature conservation are certainly familiar with this concept. Several people recognise that fishery deteriorates and that pollution takes place and so on. So they are conscious to a certain extent that a specific kind of use has consequences. It should be the case that those who have this knowledge share it with others.
• **How do you assess the possibilities to implement the concept “Regional Landscape Strategies” in the mainstream administration? Is it possible to have them over the whole country?**

This is a very big task. Landscape Strategies emanate from the approach to recognise all values of a landscape and will foster a intersectoral thinking. Today a sectoral thinking is common. In order to be able to implement Regional Landscape Strategies, you have to integrate more the existing activities of the administration. Sometimes I wonder whether it is possible to implement this in the existing administrative structures. Immense changes are necessary but you have to start at one point. It is difficult to change attitudes or the way of thinking; for a long time we thought very sectoral and this is not right since everything is connected and belongs together. The landscape is a cycle and everything interacts.

The term biodiversity was enlarged a lot and the Ecosystem Approach was included that means everything should be seen in its context and the interactions should be observed. It is important to think intersectorally because what we do in one sector can influence another one. I hope that it will be possible to implement Regional Landscape Strategies countrywide. This is a fantastic way of thinking – intersectoral and with regard to the connections and effects that one action or decision can have.
Attachment 3 - Interviewee: Doris Pokorny

Interview guide - Conservation and sustainable use of biodiversity

Management area: Biosphere Reserve Rhön

- How long do you work in connection with the MAB program?

I have worked in the MAB reserve Rhön since 1991. For the first time, I encountered the MAB programme at the end of the 1980’s since I worked for the programme NR. 6 “ecosystem research” (human influence on mountainous ecosystems). Meanwhile the MAB programme concentrates strongly on Biosphere Reserves and uses these areas for investigating research questions connected to human-environment relations as well as for applying the resulting solutions. The MAB programme was leading and ahead of the times long before the term “sustainable development” was elaborated.

A The MAB concept - commissioned to find the balance between sustainable use and conservation

- What do you think are the crucial elements and tools of the Biosphere Reserve concept that ensure the integration of conservation and sustainable use?

Compiling of a management plan/ concept

A main demand of the Biosphere Reserve concept is the elaboration of a concept containing the aims of the regional development, which in contrast to accustomed administration shall happen in cooperation with local people. This management plan may include a fundamental analysis of important kinds of use, conservation aims and possible activities, for example. In the ideal case the affected stakeholders shall realise these aims in their every-day working situations.

Zonation

It is impossible to reach all development goals of a Biosphere Reserve (e.g. conservation, sustainable development, research) on one and the same area. Thus a spatial and temporal differentiated concept is necessary, that assigns certain aims or emphasises like sweeping land use to single areas. In an ideal case this leads to win-win solutions that satisfy even stakeholders with different interests.

Model region

Biosphere Reserves have a model status; thereby they enable the testing of unconventional and financially hazardous ideas. Thus new and sustainable forms of use can be found.

Cooperation

The linking-up of different groups of interest and societal actors (firms, administrations on different levels, associations) is a further fundamental element of the Biosphere Reserve concept. This can happen on a formal or informal level. This is even more challenging in the Biosphere Reserve Rhön since three federal states are involved. The team “species conservation” works cross the borders of the federal states and consists of both professional and voluntary people. They reconcile conservation strategies valid for the whole reserve area. More formal groups that work together on the county level are able to apply for funds of programmes like LEADER+ or ELER. But even in the private sector there are several cooperations, which aim to promote regional products.
Research
The scientific investigations conducted in Biosphere Reserves shall strongly be oriented on the concrete problems in the Reserve. Then research is able to design the land use in a region sustainable.

Environmental education/ education for sustainable development
In general it is important to integrate research and education, thus the success achieved is long lasting. The concept “education for sustainable development” comprises other aspects beside the classical environmental education, as for example the aim to create an understanding for the whole regional value creation chain in all age groups.

- The MAB reserves are model regions for the integration of sustainable use and conservation. Which achievements should be transferred to general ecosystem management or nature conservation management?

A substantial obstacle for sustainable development is the sectoral organisation of the administration. Biosphere Reserves try to overcome the disadvantages of this structure with the help of the essential elements included in the concept (compiling of a management plan/concept, zonation, model region, cooperation, research, environmental education/education for sustainable development). Therefore it would be desirable that all elements could be included in the mainstream administration. Biosphere Reserves want to be a juncture for several stakeholders in the nature and environmental sector; this is especially significant.

Local Agenda 21 processes on a parish level are a promising approach, implementing the main feature that are determining for Biosphere Reserves as well on a lower administrative level. As mentioned before, a kind of juncture or connection point would be desirable, at least on the county level; this would secure a better integration of nature conservation and sustainable development. It seems utopistic to overbear the existing division reaching up to the ministerial level, which even results in different emphasises of public aid.

- MAB reserves strive to legally protected areas (at least the core area, mostly even the buffer zone should be under protection). How would you assess otherwise the possibilities to promote sustainable land use and nature conservation?

Basically, areas are declared as a kind of reserve in order to solve conflicts of nature conservation with free time activities or direct land use. For example, it is only possible by designation of a legally protected nature reserve to constraint the citizen’s right to enter the landscape. According to the experiences we made in the Biosphere Reserve Rhön, effective nature conservation especially in the agricultural sector without the designation of reserves is only possible if other incentives fully compensate the lost benefits for the affected stakeholders. This is more difficult in high-productive areas.

In a concrete area in the Biosphere Reserve Rhön, there is a conflict between nature conservationist and sportsmen doing aviation. The respective association stopped the designation of a nature reserve. A kind of voluntary self-commitment shall ensure that the protection aims will be fulfilled. The chances for success are heavily doubted because previous compromises were partially ignored and possibilities of persecution are missing. A commitment of this kind should contain exact terms of reference that can be checked and evaluated after a definite time.
B The selected MAB reserve – Rhön

- Which significant conflicts between conservation and sustainable use do you see in the MAB reserve Rhön? AND
  Tourism is identified in the research plan as a important potential for regional development and at the same time possible conflict with nature conservation issues. What is done to find a compromise in this field?

**Free time activities**
Most conflicts between conservation and sustainable use are in connection with free time activities; mostly in the 10% of the reserve area that is nature reserve. Mainly the focal points lies in sensible expanses that both are habitats for sensitive animals and attractive areas for leisure activities (especially hiking and skiing). Violation of the rules of conduct (e.g. not to leave the pathways) can heavily damage the surrounding. Therefore a legal form of punishment is necessary. Informing the people is important but in most cases not enough to canalise leisure activities.

Spatial and temporal differentiated plans for the use are a key element for compromises. Some free time activities are problematic only at a special time (e.g. season) or in distinct areas. One successful example for the mediation between interests of nature conservation and free time activities in the Biosphere Reserve Rhön is the route plan for mountain bikers, which was elaborated in cooperation with the German Bicycle Club. It aims to exclude the bikers from sensitive areas. This plan was created at a time when mountain biking was not in vogue. Doing so the chances to find solutions compatible with nature conservation are quite high because it is an action instead of a reaction. In this way you avoid to be behind the development and provoke significant protests. Therefore it is more suitable to offer compromises acceptable for both sides in good time.

**Settlement development**
Settlement development is another conflict, which does not directly collide with nature conservation aspects but with the protection of the cultural landscape and the scenery. A recently published environmental report of the BR Rhön showed an overproportional rising of settlement (e.g. developing areas) despite of the low population density. This development is questionable in terms of sustainable development.

**Land use**
In general land users are very cooperative and gladly take offers in connection with nature conservation as additional source of income. Unfortunately due to certain aspects of the agrarian policy tendencies of use can emerge that are opposed to sustainable use and development. One example is the funding of grassland maintenance independent from the measure used. That means even if the landowner cuts the meadows instead of grazing animals the money is paid. Regarding sustainability in terms of regional cycles for example this is quite suspect. But these are more external driving factor that lie outside the classical conflicts with nature conservation.

- The MAB concept demands a percentage of 3% core area and the German MAB committee wants to encourage the MAB Rhön to increase the present 2.27 % core area to the demanded rate. What do you think about this strict number in connection with conservation and sustainable use?
The UNESCO guidelines demand a conservation concept with core, buffer- and development zone with 3% minimum core area. This idea comes from the aspect that often National Parks, which are not used by humans, are the core area of a Biosphere Reserve. Naturally, core zones that prohibit any kind of use are difficult to establish in cultural landscapes where the emphasis of biodiversity conservation lies definitely on sustainable use in the buffer zone, at least in the Biosphere Reserve Rhön. At the moment, we discuss with representatives from the forestry sector to stop the use of certain areas in favour for nature conservation. We need these areas to reach the demanded 3% core area in the MAB Reserve Rhön. But in times of rising energy prices, even areas with low yield are attractive for forestry.

I think it is acceptable to demand a core area of at least 3%. Developing countries are supposed to fulfil this request without mercy and it is because of this industrialised countries should strive to reach this goal, too. Otherwise it would be unfair and the industrialised countries would lose their face. But it has to be stressed that the allocation of the areas is of similar importance. In the BR Rhön the core areas are splitted and therefore cannot secure sufficient space for natural succession. Therefore it would be important to demand a connected area instead of a fixed percentage of 3%.

- The MAB reserve Rhön is known for excellent applied research in the ecological, social and economical sector. How do the affected stakeholders perceive possible restrictions?

Research only can pose the right questions, analyse these, assess the results and add advises for their implementation. But the respective decision makers on the parish level, in the tourism, forestry and agricultural sector have to take the measures resulting out of research. The Biosphere Reserve wants to mediate in this case, because it claims for necessary research relevant for the respective area. Than BR’s can encourage the decision makers to pay attention to the results, but nobody can be forced to do it.

- Region-based marketing of products through labelling and different kinds of regional cooperation are significant ingredients for the success of the MAB reserve Rhön. How do you assess the importance of these issues for the establishment of sustainable land use in general?

Consumption is crucial for sustainable land use. Indeed, we live in a globalised world, but local butchers and especially the gastronomy sector should concentrate more on the regional surrounding. This would support the land users in the area. The main aim of the regional label is to encourage as much stakeholders as possible for the idea of regional production and marketing and thereby be able to achieve a change of conscious among the local population. Regional marketing is crucial regarding the regional value chain, because new jobs are created. A diploma thesis revealed that 120 new jobs were created due to the designation of the BR Rhön.

- The German MAB committee criticises the low percentage of organic farming in the Rhön reserve. Which challenges do you see for the achievement of sustainable land use in the reserve area?

It is not understandable, why no more farmers convert to organic farming. There is a market, at least for all kinds of cattle. At the moment, there are many little farms driven by old people
that risk to lay down there activity now. One point may be that little farms do not want to invest a lot of time and money for the conversion to organic farming. Furthermore, the subsidies are less now than some years ago.

But it has to be said that even conventional cultivating farmers can work sustainable. Even though organic farms are excellent in this matter. But if the livestock is handled according to the species’ demands and if synthetic fertilisers are used in a cautious manner, conventional farming can be called sustainable, too. There can hardly be detected a difference between these two types of land use in the actual landscape. Sadly, it is not possible to find differentiation beside organic farming due to lack of control mechanisms.

- **Biosphere Reserves shall strive for the integration of conservation and sustainable use. How would you define these terms?**

The definition of the terms conservation and sustainable use is easy in the context of central Europe. This is because in most ecosystems human use enhanced biodiversity. Concerning this, sustainable use is a prerequisite for nature or biodiversity conservation. Without the respective form of land use, the conservation of the cultural landscape with its corresponding diversity is impossible. Only after the Second World War, the use of heavy machines and synthetic fertilisers became a threat to the biodiversity of cultural landscapes.

If the rule - no conservation without use – is valid in other parts of the world as well can be doubted. In areas with hardly any human impact, the establishment of large protected areas might be more important for the maintenance of the respective biodiversity.

For central Europe, islands of wilderness shall be created and saved, and even outside these areas the protection of wilderness shall be possible. Furthermore, these areas have to be integrated into a network of biotopes. There are two concepts of nature conservation: integration and segregation. For central Europe, only integration can be the right choice. Questions of nature conservation have to be connected to land use, they can not be separated. But especially the BR Rhön shall not become a “Buchonien” (land of beeches, the author), but remain a land of the open expanses.
Attachment 4 - Interviewee: Jürgen Peil

Interview guide - Conservation and sustainable use of biodiversity

Management area: MAB Reserve Schorfheide-Chorin

- **How long do you work in connection with the MAB program?**

I myself work in the Biosphere Reserve Schorfheide Chorin for 16 years. Thus I could observe both its success and decline phase. The background for this development are actual events in the politics and administration of nature conservation. Nature conservation is seen as an obstacle for societal development.

A The Biosphere Reserve Schorfheide - Chorin

- **Which significant conflicts between conservation and sustainable use do you see in the MAB reserve Rhön?** I chose this expression for purpose, since it is used for example in the concept of MAB reserves. Furthermore I doubt that every status of biodiversity can be achieved by use since core areas with the exclusion of direct human use have to be separated from sustainable use.

I think the expression “conservation and sustainable use of biodiversity” is not clear; instead “conservation of biodiversity through sustainable use” would be better. If a certain biodiversity exists, it should be used also, in a sustainable way naturally. The ratio of traditional, protective nature conservation and active nature conservation in areas with strong emphasis on human use is determined by the zonation:

**Core area:** (ca. 3%): Today they are called nature development areas where nature can develop without human interference, apart from research. But problems connected to this use are the high percentage of game animals that do not have to fear hunting in the legally protected areas. This hinders the natural development and without few annual hunting events, this is not possible to mitigate. The only alternative is to build a fence around the whole area.

**Buffer zone:** Nature reserves with limited land use are part of this area. They shall buffer negative effects on the core zone.

**Development area:** This area is a so called landscape reserve and even conventional kinds of land use are possible there.

These are the facts that determine the possibilities for nature conservation. But even small water bodies are protected and not used in the development area, that means, there are no fishing or water sports activities. So there are natural areas inside the used landscape. Conservation of natural areas can be successful only through sustainable use of the surrounding area. But furthermore it has to be said that the abiotic subjects of protection like water, soil and air are not sufficiently taken into consideration although they should be the first aim of protection. If they are saved, a corresponding state of biodiversity is saved as well. To decide if there arise more conflicts out of protective nature conservation or with sustainable use makes necessary to define sustainable use. Are unsustainable and conventional land use the same? Even time dimensions has to be taken into consideration.

*The UNESCO-definition states that species should be able to maintain viable populations despite of land use.*

This can be achieved only with sustainable land use that is especially designed for certain species. But land users have to have a respective attitude and have to think about these things.
Many land users are grown up in this area and are connected to it. Thus they easier mind these aspects. But especially after the political changes in 1990, more land users of other areas came here, that do not have this connection to the area.

**Renewable Energies**
A critical point regarding sustainability are renewable energies. Wind power is criticised a lot, but the possibility to take the installations away easily is their great advantage. A fabric in the area produces bioethanol. Sadly, this includes a nutrient-rich by-product that once was deposited in the landscape by accident. Due to public subsidies biogas- power plants increase in number, too. The necessary cultivation of monocultures has negative effects regarding sustainability. GMO’s are cultivated and in dry seasons, irrigation is necessary. This is critical especially in the dry region the BR is situated in. Deep aquifers have to be used to secure the water supply. The developments in the agrarian industry are critical, because they only aim the pure economic profit. But promised jobs are an effective measure for local politicians.

1. **Cautious human activity can increase biodiversity. In which areas lies the emphasis on sustainable use and in which on protective conservation measures?**

This is determined by the zonation of the reserve. Additionally, landscape elements (e.g. small waterbodies) and biotopes according to § 32 of the nature conservation law are strongly protected. Forests are not included in this law, they are managed by the forest administration. The conversion of forest monocultures to mixed communities is planned, but even opposed voices can be heard that want to establish pine monocultures. Only a few years ago, much was invested into the conversion of forests, because they affected adversely the water household of the landscape.

2. **How is the state of the cultural landscape determined? Is a high biodiversity, a „near-natural state“ or practicability most decisive?**

There is so to say a natural species composition and one characterised by synanthrophic species. And most endangered species in central Europe are part of the last named group. Indeed, it is difficult to determine the state of the cultural landscape that is worth to determine, but one should be realistic. It is nonsense to establish a big open museum for land use of the Middle Ages. Furthermore, it is a crucial question, because biodiversity is difficult to calculate due to natural variations. For example, the ratio of pests and beneficial organisms can vary and reach different states of biodiversity. There are numerous forms of planning that give a framework for public nature conservation. The classification of biotope types and corresponding levels of endangerment is the basis for developing measures for the maintenance of biotopes.

The abandonment of land use and saving of abiotic resources in fen mires has a very high priority to ensure that these areas can fulfil their numerous ecological functions. But it has to be said that replacing biotopes like extensively used wet meadows have a species composition similar to fen mires. With a technological and temporal adaptation, these areas can be used. There are management plans for single conservation areas containing concrete measures necessary for the maintenance of the area. For dry meadows, the necessary grazing activities can be adapted to the respective biotope; even contract nature conservation can be useful. The existence of certain species means automatically special measures that shall minimise disturbances.
The question of the state of the cultural landscape worth to maintain remains difficult to answer. One example is the case of pollard-willows, which are a cultural-historical product with a high value for nature conservation as well. Since there are no more economical interests in their use and care, society has to decide whether these willows have to be maintained or not. Funding is the crucial problem here, too.

3. **The zonation of the BR Schorfheide-Chorin is not completed yet. What is decisive for the zonation? Are property rights an important subject, for example?**

Basically, nature-conservation aspects are most important. There are only small patches left that are not included in the zonation concept. Property rights may be important, when core areas are on private ground. In these cases, plans are discussed in public and the affected persons can change their patches, for example. But if the public interest weighs more, these people have to act accordingly. A sad trend is the matching of the edit for nature reserves with all affected stakeholders and lobbyists in advance to make possible an agreement. Thereby the edict is disarmed very much and nearly senseless.

4. **How is the research project „nature conservation in the agrarian landscape“ implemented in the area?**

Sadly, the implementation and multiplication of projects of this kind is very bad due to deficiencies in funding. Public funding often supports research projects that elaborate similar approaches again and again. This supports the education of new scientists but lacks the practical implementation. The research project elaborated useful practical results. It was revealed that large-scale organic farming can have negative effects for nature conservation. The respective farm expands 1200 ha and the working processes regarding width of machines for examples. In some cases, there can be more damage from large-scale organic farms than from small-scale conventional farms. One outcome of the research project were measures how to save skylarks in fields, but this costs about 300 € and this inhibits the implementation. EU-policy can be exacerbating in this case, because the market regulating funds are much higher than the second column for nature conservation.

5. **Is Local or traditional ecological knowledge included for designing sustainable land use? (E.g. grazing of dry meadows)**

Naturally, there are groups demanding the adaptation of land use aspects from 60 years ago. This form of land use was very intensive on the one hand, but conducted sustainable on the other hand, regarding soil fertility for example. These were necessary actions in these times. We do not have to renounce to technical advantages, but some features of these older types of land use like cutting times, width of machines, qualities of machines etc might be worth to mind. The abdication of chemical substances is only a little part. To sum it up, the BR is interested in scientific knowledge, but at the end, very basic rules of conduct are decisive for a sustainable land use.

6. **Do ecological thresholds are important for the designing of land use? (E.g. nutrient input in lakes and groundwater?)**

Ecological thresholds, especially high nutrient inputs are not important in the BR, since nutrient loads were always low (around 120 kg N/ha a⁻¹). Surely, the intensity of use can rise in the future with increasing prices for biomass for power plants of renewable energies.
B The MAB concept - commissioned to find the balance between sustainable use and conservation

- What do you think are the crucial elements and tools of the Biosphere Reserve concept that ensure the integration of conservation and sustainable use?

The expression “conservation and sustainable use” is not suitable; a preferable expression would be “conservation of biodiversity through sustainable use”. Biodiversity can be saved through non-use and sustainable use in other realms.

*I chose this expression, because it is used in the respective concepts. But I want to find out if it is meaningful.*

It is surprising that this definition is used even in younger texts. Sustainable use always comprises economic sustainability; an example can be the cultivation of old species of fruit trees that can be done with sufficient profit. In this way, the existing biodiversity is used sustainable. Furthermore, there is natural biodiversity that can be maintained through sustainable use or non-use.

A pine monocultures cannot be called “biodivers”, because than the concept would be contradictory. Only two species do not make the system biodivers, but it remains a monoculture. That why pine monocultures should not be included into the concept of biodiversity. If pine monocultures would be part of the biotope classification, it would be another question.

*But „biodiversity“ is a scientific concept and the number of species cannot be decisive for the inclusion of habitats into the concept of biodiversity.*

There are natural pine habitats and this species is common in mixed forests, too. One would have to say in an old beech forest are not much more species than in a pine forest. Consequently, GMO’s and combinations with natural species would have to be included into “biodiversity” as well.

My interpretation would be that the variety of species makes possible various kinds of use. For the rest, nature conservation is reached by legally protection or concerted measures that provide a kind of artificial conservation. Several measures do not count as “agriculture” since there is no economic interest any longer. Without these measures, the potential natural vegetation would return.

- MAB reserves strive to legally protected areas (at least the core area, mostly even the buffer zone should be under protection). How would you assess otherwise the possibilities to promote sustainable land use and nature conservation?

Nature conservation is increasingly difficult because it is seen as an economic obstacle. That why legal protection of areas is an important measure.

- The MAB reserves are model regions for the integration of sustainable use and conservation. Which achievements should be transferred to general ecosystem management or nature conservation management?
First of all, it is important to say that the work of the Biosphere Reserve is highly dominated by political developments and other events. This exacerbates the work of the BR enormously and inhibits the adoption of management strategies from the Biosphere Reserve on a higher level. More support from the UNESCO or the German MAB Commission would be desirable. New actions and enterprises should be tested more soundly regarding their ecological effects and sustainability. This is particularly the case concerning renewable energies, which increase due to huge political and financial support.

A part of Biosphere Reserves should be their model funding as a prerequisite to develop solutions with model character. Sadly, due to phasing and job cut in the federal state Brandenburg, this hardly happens. The distortion of competition pretend to be the decisive reason. Even a moral support from the society would be necessary for a successfully working Biosphere Reserve, but sadly this is hardly the case now. Furthermore it has to be mentioned that the Biosphere Reserve Schorfheide is increasingly reduced to the touristic level. Thereby many chances offered by the institution Biosphere Reserve are neglected since the installation of information boards and centres is not sufficient for a model region. It is not a privilege for land users to work in a protected area of this kind any longer.

Positive issues thanks to the work of the Biosphere Reserve are for example the very high percentage of organic farming (ca. 25%) compared to the rest of Germany (ca. 6%). Moreover, settlement policy is tackled in a more sustainable way. A plan listing all existing and available draft- and industry areas could avoid the unnecessary establishment of further areas of this kind. Also the water household of the landscape could recover thanks to renaturation activities and conversion of forests.
Attachment 5 - Interviewee: Stefan Woidig

**Interview guide - Conservation and sustainable use of biodiversity**

**Management area: Biosphere Reserve Süd-Ost-Rügen**

- **How long do you work in connection with the MAB program?**

I myself have worked in the Biosphere Reserve Süd-Ost Rügen for 2 years and I am person in charge for publicity and communication.

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**A The Biosphere Reserve Süd-Ost-Rügen**

**Do you see conflicts between nature conservation and sustainable use in the Biosphere Reserve? Which obstacles and possibilities do you see for a sustainable small-scale fishery?**

Naturally, conflicts are a natural by-product on all levels; this is confirmed by other colleagues, too. The emphasis in a Biosphere Reserve lies definitely on the development function. Sadly, this function is not communicated sufficiently to the local population, limitations are perceived as the dominating phenomenon. Until 2006, the administration of the Biosphere Reserve was subordinated under the board for the national park nearby. That why, the Biosphere Reserve had big acceptance problems after the designation in 1991.

Surely, national parks and biosphere reserves have different aims and thus the BR was hardly present in the area. The conflicts between landowners and the administrations of the parishes and the Biosphere Reserve even lead to a variation in the respective federal law. The resulting changes for the personnel demand time and therefore, the effective work of the Biosphere Reserve starts only now.

**Do you think that the term “reserve” was pivotal for the problems of acceptance?**

The term “reserve“ is no ideal choice, because limitations are easily associated with it. But in the case of the Biosphere Reserve Süd-Ost-Rügen this was not decisive. The reserve was experienced rather as an institution that prohibits planning activity and so on. But this was not the case anytime since the BR administration is the lowest authority for nature conservation and has to act according to the law.

Furthermore, the BR is a regional agency that shall steer and foster local development processes. Due to the problems of acceptance, this is a great challenge. Despite the BR is already accepted much better now, this is a continuos process. We try to cooperate with the local stakeholders (parish administration, tourism etc.) and to compile projects together. Our publicity activity is designed accordingly.

Most conflicts with sustainable use can be seen in connection with conventional agriculture, covering almost 100% of the area. Traditional forms of land used vanished totally in the region. Another crucial point is the settlement development, in this subject, the BR administration could not achieve the respective authorities to change their habits. In the tourism sector there is a good cooperation with the Biosphere Reserve, the only problem is the increasing personal traffic. But this problem cannot be solved by the BR alone since the cooperation of the parishes is required absolutely.
Fishery is not a problem for sustainable use or conservation since the importance as economic factor is neglectable. In contrast, the small-scale fishery disappeared almost totally. With the political changes 1990, subsidies dropped out and lead to the decreasing fishing activity. There are no management plans since there are only three fishermen left in the BR that catch fish. Before 1990, small-scale fishery represented 100% of all fisheries in the Greifswalder lagoon. This economic sector would rather need a well-regulated development.

- **Tourism is identified as an important potential for regional development and at the same time possible conflict with nature conservation issues. What is done to find a compromise in this field?**

The BR works in close connection to the tourism sector since its representatives regard a new orientation as necessary. One reason are the possible changes in tourist numbers because they will not be satisfied with swimming vacation only, therefore the average utilisation will decrease. The Biosphere Reserve is elaborating new offers at the moment in order to distinguish the BR from other holiday areas. One example is the “vacationist-ranger-project“ in cooperation with a private provider. The tourist shall be integrated into nature conservation and possible outcomes shall be available for the BR administration. Representatives of the tourism sector agree that the numbers of tourists should not be higher, this is neither possible since other tourist regions work hard, too. We rather try to establish measures enlarging the offer or prolonging the season. The personal traffic is a strain regarding nature conservation, but tourism is not a big problem. A network of pathways for hiking tries to mediate the impact of vacationists.

- **A national research project covers most of the BR area. How does this determine the work of the Biosphere Reserve?**

There is a close cooperation with the association for landscape conservation „Ostrügensche Boddenlandschaft“ and compile projects like renaturation together or discuss strategic questions.

- **Regionalization of agriculture and fishery is one aim of the Biosphere Reserve. How do you assess the success of hitherto existing initiatives like the associations “Rügen products“ or “model region Rügen“ (both translated by author)? What is their potential for sustainable land use?**

The regionalization of agriculture and fishery is hitherto not very successful. The “model region Rügen“ is an initiative from the beginning of the 1990’s and is not active any longer. “Rügen products“ instead is a promising approach, but this initiative emphasises inter alia organic farming and this takes place outside the BR.

**B The MAB concept - commissioned to find the balance between sustainable use and conservation**

- **What do you think are the crucial elements and tools of the Biosphere Reserve concept that ensure the integration of conservation and sustainable use?**

I think, only the interaction of the single elements can reveal the whole value of the Biosphere Reserve concept. Therefore specific elements should not be stressed.
• **The MAB reserves are model regions for the integration of sustainable use and conservation. Which achievements should be transferred to general ecosystem management or nature conservation management?**

Particularly important is the integration of local stakeholders and representatives of different interests in planning and decision processes. There should be an open forum where all sorts of stakeholders can discuss independently about the development goals for the region. The demands to an area without legal protection can vary a lot. Therefore this kind of meeting place is suitable for solving conflicts. In most cases, economic issues are prioritised, but according to my experiences it is meaningful to discuss and connect the interests of different user groups. Thereby decisions can be implemented much earlier. It is obvious in the BR Rügen that the connections to the affected stakeholders are better now and therefore the aims are easier to reach. If this exchange between different stakeholders could be transferred into mainstream administration, this would be a great advantage.

• **MAB reserves strive to legally protected areas (at least the core area, mostly even the buffer zone should be under protection). How would you assess otherwise the possibilities to promote sustainable land use and nature conservation?**

If it would be possible to initiate a shift in thinking and attitude of the population, it might be possible to renounce strict protective measures. But this is not probably to happen and therefore protective measures remain an important instrument.

*This question was posed in regarding demands of researches that desire a more flexible design of nature reserves in order to meet the spatial needs of species conservation. How do you assess the applicability of these demands?*

This is difficult to implement. The great advantage of BR is the possibility to reach a good state of nature and environment by certain forms of use and use at all. Often, the activity of humans is decisive for the maintenance of the values of the landscape. Furthermore, core areas are a territory without any direct human use and thus a natural development is possible.

• **The MAB concept demands a percentage of 3% core area. What do you think about this strict number in connection with conservation and sustainable use?**

It is hard to assess if this number is justified or not. Important is the protection of certain areas as core areas.

• **Biosphere Reserves try to reconcile sustainable use and conservation of biodiversity. How would you define these two terms?**

The conservation value of the landscape is a result of the human use over centuries. Especially the general conditions of the German agriculture exacerbate the maintenance of these forms of land use. One example is the grazing of dry meadows with sheep. Indeed, there is some public appropriation for the establishment of conservation friendly land use but it is a challenge to persuade land users to use them. But this kind of use is definitely a form of nature conservation since the cultural landscape is maintained.