FULL OF LIFE

UNESCO Biosphere Reserves – Model Regions for Sustainable Development

Imprint

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Forewords

1.

Foreword by the Director-General of UNESCO

Regions and local areas are increasingly important to humankind in times of globalisation. Being able to identify with the area in which they live gives people a sense of belonging and direction, and satisfies the human need for a familiar environment of manageable dimensions. In times of rapid growth and constant change, local involvement enables people to contribute directly and actively to decision-making. This explains in part the increased interest in a success of regional development. Indeed, regionalisation is complementary.

At the same time, global sustainable development has become a key goal for national authorities at the very highest level since the UN Conference on Environment and Development in Rio in 1992. Sustainable development – the balance of ecological, economic and socio-cultural elements, taking into account the needs of future generations in today's decision-making processes – must first be achieved and demonstrated on a more local level.

One of the earliest initiatives to address this issue has been the UNESCO Programme Man and the Biosphere (MAB), with its world network of biosphere reserves and principles of voluntary participation.

One of the most important tasks for the MAB Programme is the development of the biosphere reserve concept. A biosphere reserve is a combination of cultural and natural landscapes that are representative of a country or region, with certain areas designated for nature conservation and others that are managed sustainably. The MAB concept actively incorporates the people living and working in these areas into the further development of the region. Biosphere reserves, therefore, are model regions of sustainable development that are structured in the same way and based on the same principles all over the world. Accordingly, biosphere reserves represent not only different eco-systems but also the broad spectrum of different cultures and economic practices around the world. There are currently 440 UNESCO biosphere reserves in 97 different countries within this worldwide network.

The MAB Programme and its biosphere reserves not only provide suitable research areas and attract highly qualified multidisciplinary scientists, they also offer a committed local population and over 30 years' experience in implementing and testing projects in the area of sustainable development.

I am pleased that Germany – as a highly industrialised country – is committed to developing and testing models for sustainable living and economic practices. This initiative by the German MAB National Committee is warmly welcomed by

the MAB community and by the whole of UNESCO. As a diplomat active for many years in promoting economic co-operation for development and in protecting the world's heritage, I also have a great personal interest in the initiative. Publicizing the MAB Programme and the services offered by the UNESCO biosphere reserves to a wider audience, both in German-speaking regions and – with the publication of an English version – internationally, is a further important step. I would like to offer a special word of thanks to the German MAB National Committee and all the scientists involved. Above all, I would like to applaud the understanding, commitment and efforts of the people living in the German biosphere reserves. This book is a valuable contribution to the further development of the UNESCO Man and the Biosphere Programme in Germany and in the world.

Koïchiro Matsuura
Director-General of UNESCO
Paris 2003

Foreword by the Publisher

Dear Readers

How do you want to live in the future – in five, ten or twenty years? What do you wish for your children's lives? Your answer is sure to include safe jobs, a liveable environment, cultural diversity, high environmental quality, attractive landscapes and development opportunities, both personally and for the region in which you live.

There are many blueprints for the future. Often they are too theoretical and involve the people they affect much too little. Since 1971 the UNESCO Programme Man and the Biosphere (MAB) has claimed that it designs and tests models for future development with local people involved. Throughout the world, different paths are followed in 440 model regions, which UNESCO calls "biosphere reserves". This leads to solutions that are both innovative and follow traditions that have proved their worth locally and that can often be transferred to other regions. Very often, these solutions function as an important basis for political decisions because they give equal consideration to ecological, economic and social aspects in an exemplary fashion.

Fourteen areas in Germany belong to the World Network of Biosphere Reserves. The German MAB National Committee – reappointed by the Federal Minister for the Environment, Nature Conservation and Nuclear Safety in the year 2000 – has mainly worked on the conceptual further development of the MAB Programme at national and international level and has also periodically reviewed the German biosphere reserves on behalf of UNESCO. In this book we are going to portray the current state of development in the individual areas, visions and very concrete ideas as well as the potentials of the MAB Programme and our biosphere reserves for shaping the future. We would like to reach a broad readership with this book and we have therefore designed it as "scientific reading" or "readable science". All in all, more than 60 authors have taken part in creating this book. They reveal the large variety of players involved in implementing the MAB Programme. In their contributions they give their own opinions, views and experience. The articles in this book are just as different and diverse as the biosphere reserves themselves.

We thank all of the authors for their commitment, which contributed to the success of the project. This publication was planned and realised in less than a year. This was only possible due to the enthusiasm, the elan and the great dedication of all involved. The MAB Programme is "full of life"! The work on this book has impressively proved this to us and whetted our appetite for the future.

Naturally, the compilation of this book was associated with considerable editorial and coordination work due to the vast difference of the articles and the large number of people involved. We would therefore like to thank Thorsten Meyer and Stefan Bröhl from the agency "M&P – Partner für Öffentlichkeitsarbeit und Medienentwicklung GmbH" for their committed editorial work. Our special thanks go to Birgit Heinze from the Secretariat of the German MAB National Committee, who took on the organisation of the entire project with a great deal of enthusiasm and tremendous dedication.

German MAB National Committee
Bonn 2003

Sustainable Development: The Contribution by Biosphere Reserves

2.

2.1 *MAB – a Programme over the Course of Time*

Alfred Walter, Folkert Precht and Rolf-Dieter Preyer

The UNESCO Programme Man and the Biosphere (MAB) was established in 1970. It started out as a purely scientific programme and over time has grown into a world network of model regions for sustainable development (cf Chapter 2.2).

In the early days, the programme objective was to acquire the fundamental scientific principles required at an international level for the protection of natural resources and for an environmentally compatible use of the biosphere. The MAB Programme was therefore the first international environmental programme focusing on the relationship between humans and the environment.

Nearly all UNESCO member states started national implementation immediately after the launch of the Programme. By setting up MAB national committees, the Federal Republic of Germany and the German Democratic Republic in 1972 and 1974 respectively, fulfilled an essential formal requirement for participation in the MAB Programme.

As an applied research programme, it quickly became clear that it needed special instruments to turn the results of the research into political action. The World Network of Biosphere Reserves was therefore established in 1976 (cf Chapter 2.2).

Following the UN Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992 the participating states in the MAB Programme increased their focus on sustainable development. By virtue of their concept, the biosphere reserves should be predestined to contribute reasonably to executing the decisions made at the UNCED Conference, such as the implementation of Agenda 21 and the Convention on Biological Diversity (CBD).

The MAB Programme was granted its current conceptual foundation in the Seville Strategy, adopted by the UNESCO General Conference in 1995 (28C/Resolution 2.4).

The International Guidelines for the World Network of Biosphere Reserves, agreed at the same time, established a new institutional framework for the World Network, binding in form and content. As a result, every biosphere reserve has to comply with a series of minimum conditions before it is included in the World Network. Nature and landscapes must be protected, economic and human development promoted and environmental education, training, research and monitoring supported. The involvement of the local population is imperative to this.

The International Guidelines for the World Network lay down compulsory criteria for the recognition and periodic review of biosphere reserves. Every ten years the condition of the biosphere reserves should be reviewed on the basis of these criteria.

Following the first review of biosphere reserves in Germany in 2001, the German MAB National Committee established that "sustainable life systems and sustainable economic

development" in UNESCO biosphere reserves had been neglected at a national and international level up to this point – despite sustainable development being the focus of the MAB Programme.
The national committee regards it as particularly important to develop biosphere reserves as model regions for sustainable regional development. A highly industrialised country such as Germany has a special responsibility within the World Network to develop and test sustainable ways of life and economic systems and quality economies.

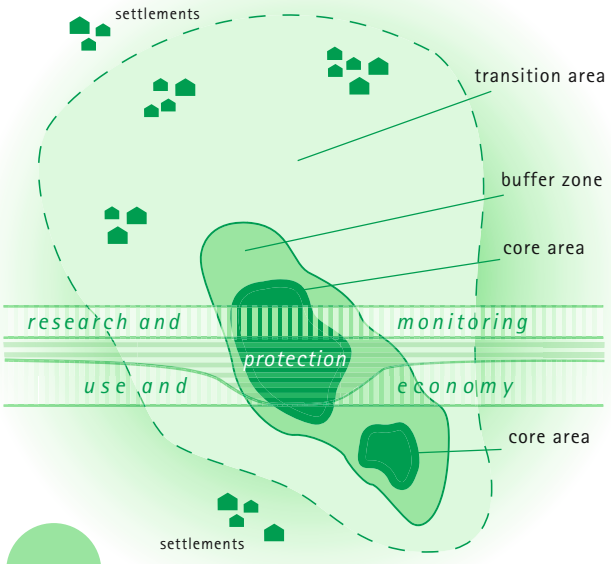


Fig.: Schematic structure of a biosphere reserve and depiction of its function. (Source: MAB Secretariat 2003, diagram: AD DAS WERBETEAM)

Literature

UNESCO (Ed.) (1996): Biosphere Reserves. The Seville Strategy and the Statutory Framework of the World Network, Paris.

2.2 *World Network of Biosphere Reserves*

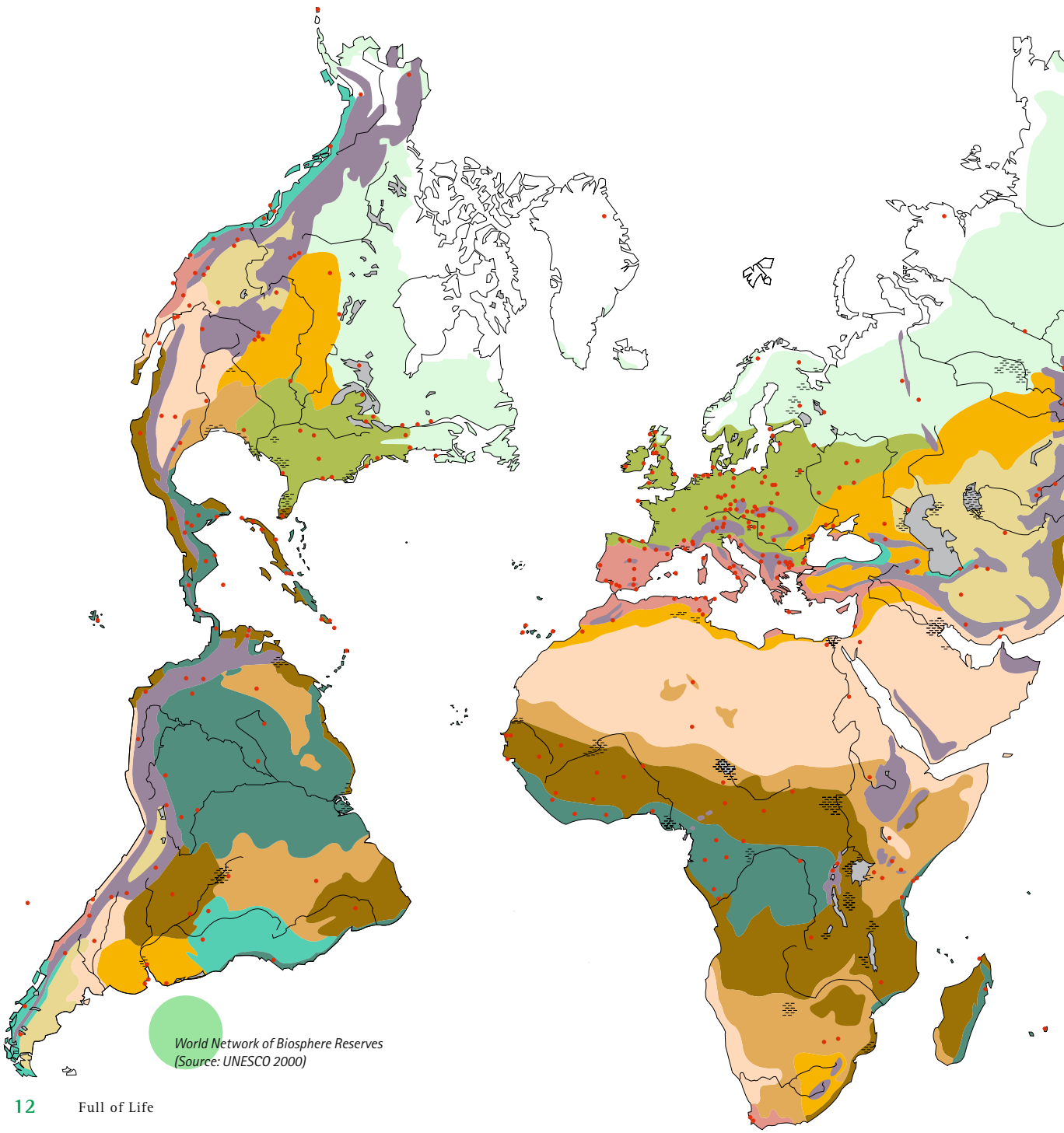
Jürgen Nauber

Biosphere reserves are the main instrument of the UNESCO Programme Man and the Biosphere (MAB). As of August 2003, 97 countries from over 140 participating states have designated a total of 440 biosphere reserves.
The Statutory Framework of the World Network of Biosphere Reserves and the Seville Strategy (1995) established a worldwide network from the many individual areas (UNESCO 1996). The Statutory Framework was approved by the UNESCO General Conference in 1995 and forms the legal basis for the biosphere reserves, without being binding under international law. However, they embody far more the principle of a voluntary approach to cooperation. By cooperating with one another, the states are committing themselves to accepting the criteria and guidelines of the MAB Programme. Biosphere reserves do not only use conventional methods to protect valuable ecosystems in their core areas, such as national parks. Much more, they also make it possible and call for a sustainable economy in the transition area of the biosphere reserve. Through the Worldwide Network of Biosphere Reserves UNESCO is making an important instrument available to the international community for the national implementation of the results of the UN Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992 and the Convention on Biological Diversity (CBD).
The Statutory Framework lays down a specific procedure for the recognition of biosphere reserves. In addition, every ten years the condition of each biosphere reserve is examined by an independent committee of experts using the criteria of the Statutory Framework and individual objectives set for each area. As a result, recommendations and suggestions for improvement are made which support the states in their efforts to develop biosphere reserves.
The World Network of Biosphere Reserves is coordinated by the UNESCO MAB Secretariat in Paris. The threads of the individual national MAB structures come together there.
The MAB Secretariat organises meetings, looks after the flow of information within the network (cf www.unesco.org/mab), coordinates studies, provides assistance with technical issues and advises on all matters relating to biosphere reserves.
The collaborators see themselves as "brokers" for the biosphere reserves and arrange financing and establish contacts. In addition, the MAB Secretariat represents the World Network when dealing with other institutions and organisations. It represents the World Network at events and conferences and when working with the secretariats of conventions and other international programmes.

2. SUSTAINABLE DEVELOPMENT: THE CONTRIBUTION BY BIOSPHERE RESERVES

In recent years, more and more biosphere reserves that extend across national borders have been recognised and registered by UNESCO. This shows that biosphere reserves also facilitate political relations. The protection and the sustainable use of connected landscapes, separated "only" by political boundaries, has been made possible through the setting up of transboundary biosphere reserves. Areas that are stable from an ecological and economic point of view have been created and relations with neighbouring countries have improved through sustainable regional development. In this way, biosphere reserves can also contribute to preventing crises and solving conflicts (cf Chapter 4.14).

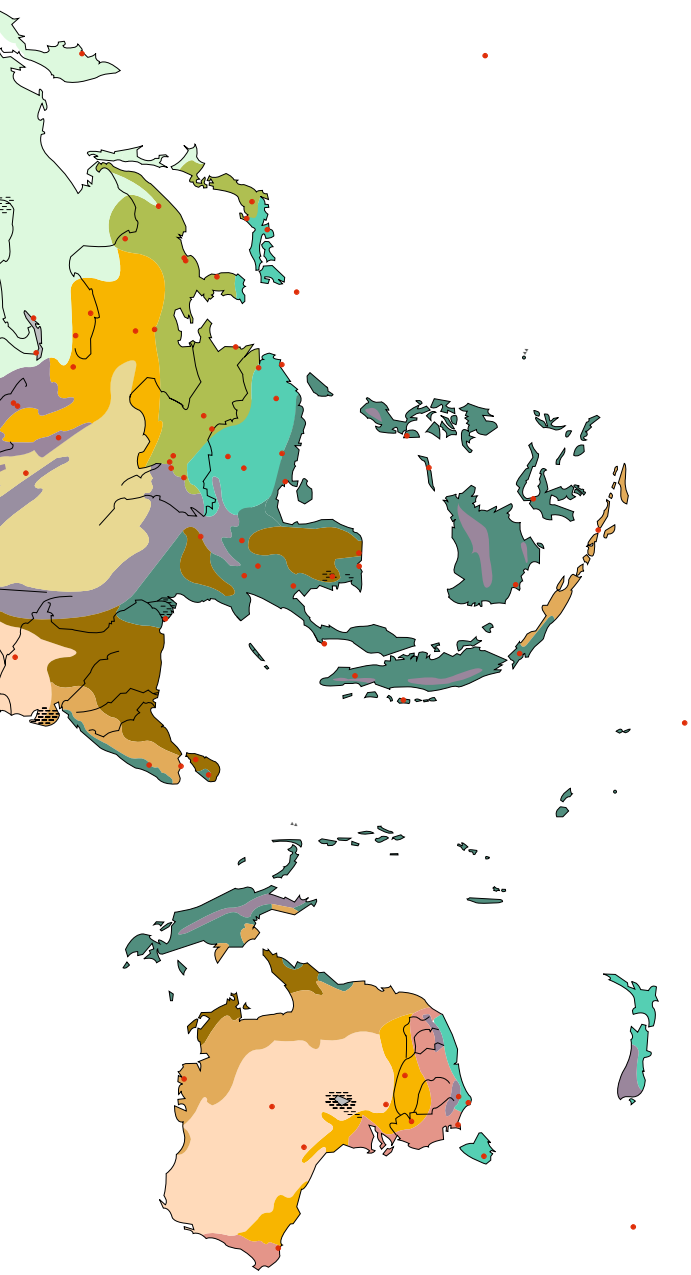
It is not only the number of applications for recognition as biosphere reserves that has increased considerably over the last five years. There has also been a marked improvement in the quality of the applications in terms of the biosphere reserves' contribution to sustainable regional development. This is a result of the adoption of the Statutory Framework



World Network of Biosphere Reserves (Source: UNESCO 2000)

and the Seville Strategy in 1995, which act as kind of guideline to the architect's plan for the successful implementation of the biosphere reserve concept. Also the surface area of the regions applying for recognition has become noticeably larger, as extensive transition areas, chosen on the basis of their economic suitability, are required to fulfil the economic objectives of the MAB Programme.

Despite all the success to date, a lot of work still remains to be carried out to develop the World Network of Biosphere Reserves. Many areas were recognised when nature conservation was the main focus of the MAB Programme. It is now necessary to expand on this so that the Seville Strategy can also be employed. The ecological work has not yet been completed, either. Many ecosystems are not yet sufficiently represented in the World Network, such as mountains, coastlines or deserts. There is also a real need to catch up on work required in many regions of Africa, Asia and South America. The World Network of the Biosphere Reserves will make an important contribution here to the implementation of the recommendations agreed at the UN Conference on Sustainable Development in Johannesburg in 2002.



The World Heritage Convention

In addition to the World Network of Biosphere Reserves, UNESCO has established another network for World Heritage Sites. In the framework of the Convention Concerning the Protection of the World Cultural and Natural Heritage – UNESCO World Heritage Convention (1972), which is an international agreement, natural and cultural landscapes have been identified in addition to cultural sites. Whereas biosphere reserves should be representative of the world's ecosystems, the universal outstanding importance of each of the World Heritage Sites comes to the fore. This is why the World Heritage Convention is much more concerned with preservation, whereas in the biosphere reserves the main focus is worldwide representative nature and development.

Nevertheless, these concepts complement one another. The core area of a biosphere reserve can also be protected as a World Heritage Area at an international level. There are many examples of this worldwide. Examples include the Aggtalek and Slovensky Kras Biosphere Reserves on the Hungarian-Slovakian border, where the chalk caves designated as Natural Heritage Sites are located, or the Palawan Biosphere Reserve in the Philippines, where two national parks have been designated World Heritage Sites and form the core area of the Biosphere Reserve (www.unesco.org/mab/BR-WH.htm).

Literature

UNESCO (1996): Biosphere Reserves: The Seville Strategy and the Statutory Framework of the World Network, Paris.

2.3 Biosphere Reserves: Model Regions for the Future

Harald Plachter, Lenelis Kruse-Graumann and Werner Schulz

MAB: The Programme for the 21st Century

When UNESCO announced a scientific programme called Man and the Biosphere (MAB) in 1971, the response was rather muted. What did it mean? And, furthermore: it was only one of very many international, regional and national research programmes that dealt with the relationship between humans and nature.

Looking back from today's perspective, this programme was the first to consistently place a basic idea at its heart that now – over 30 years later – has become a supreme global guiding principle in politics. At that time, the term "sustainability" did not yet exist as a political programme and, nevertheless, the title "Man and the Biosphere" was precisely what we now understand it to be today. Yet, this programme, just like so many others, would probably have been pushed to the back of a drawer if there hadn't been a second idea; to set up a worldwide network of representative areas where innovative, sensitive forms of nature utilisation were to be developed by research and practice: biosphere reserves. In retrospect, the name may appear unfortunate. "Reserves" are too reminiscent of protected areas that exclude people, oppress local and indigenous cultures and, therefore, not at all of a future-oriented strategy. But, nevertheless, the programme and the term have not only survived; today they are more topical than ever. The heart of the MAB Programme in the early 1970s was not much more than a vague vision in the minds of a few scientists. In politics today it occupies a similar standing to terms like "peace" or "economic stability".

Global Guideline of "Sustainability"

With the "Technical Revolution" of the first half of the 19th century and the findings of modern science that developed over the same period, for the first time in history humans had the means to free themselves from a close, not infrequently vital dependency on nature. The new technologies seemed to be so convincing that no doubts could be raised about their advantages or their long-term viability. Early critics of this technology-credulity, such as the German poet and nature conservationist Hermann Löns, remained lonely "voices in the desert" (cf PLACHTER, H. 1991).

Remarkably, that it is precisely the technology that has probably saved most human lives to date that was the one that for the first time gave rise to fundamental doubts about the limitations of scientific and social development. New types of artificial pesticides, such as DDT, helped millions of people to feed themselves adequately, to successfully fight against crucial threats like malaria, and thus to survive. However, modern ecology, which was developing at the same time, documented shocking effects on nature. Rachel Carson's book "The Silent Spring" (1962) was the first element to shatter an apparently fixed image of the world. An avalanche of reports about more negative effects of modern technology followed, culminating in "Red Data Books of Extinct and Endangered Species", the founding of environment ministries and the first serious political and economic consequences. Our societies have still not got over this cultural shock of the 1960s: undoubtedly, the needs of a rapidly growing world population could be satisfied only with the help of modern technologies and new social structures. Its risks for nature and – through nature – for human health turned out to be much greater than had been thought. Appropriate compromises that go beyond pure bans were hardly in sight and if they were, they appeared to be not realisable politically.

It was not until the second half of the 1980s that this state of affairs was tackled seriously in the political sphere. Among other things, building on a little regarded definition by the World Conservation Union IUCN (then: International Union for the Conservation of Nature and Natural Resources; cf Box 1), an international commission under the leadership of the former Norwegian Prime Minister Brundtland put a new political term at the heart of its considerations (GOODLAND, R. et al. 1992). It took up the principle of "sustainability" as a system of management that "satisfies present needs without compromising the ability of future generations to meet their own needs". Finally, at the UN Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992 the United Nations (UN) declared sustainability a general guiding principle for the 21st century. Since poverty is one of the major reasons for predatory exploitation of nature, it made the global fight against poverty into a central solution strategy. In the UN concept, economic growth and more wealth for all become the locomotive of future viability. "However, integration of environment and development concerns and greater attention to them will lead to the fulfilment of basic needs, improved living standards for all, better protected and managed ecosystems and a safer, more prosperous future..." Since the Rio World Summit in 1992, the guiding principle of sustainable development has gained a foothold in political institutions and programmes at all levels. For example, the international community has made commitments in joint

Box 1: Basic definition of the "Protection of Biotic Resources" (which means in substance "nature conservation"), by the World Conservation Union IUCN in 1980 (IUCN 1980), slightly abbreviated

(...)

- *to maintain essential ecological processes and life-support systems (such as soil regeneration and protection, the recycling of nutrients, and the cleansing of waters), on which human survival and development depends;*
- *to maintain genetic diversity (...) on which depend the functioning of many of the above processes and life-support systems, the breeding programmes necessary for the protection and improvement of cultivated plants, domesticated animals and microorganisms (...).*
- *to ensure the sustainable utilisation of species and ecosystems (...), which support millions of rural communities as well as major industries.*

agreements such as the Montreal and Kyoto Protocols to protect the ozone layer and the global climate and has advanced the fight against poverty with the Doha Declaration, which is to grant the least developed countries access to worldwide markets.

Competitive Europe

The European Union (EU), too, made sustainable development a central component of its common policy in the 1997 Amsterdam Treaty. At the 2001 Gothenburg Summit, it presented a strategy entitled "A Sustainable Europe for a Better World" that expanded the strategic goals for economic and social policy that had been laid down in Lisbon one year earlier with an ecological dimension. In its strategy, the European Commission cites the protection of the climate and resources as well as the preservation of health and mobility as key points. At the same time, it wants to make "Europe the most competitive and dynamic knowledge-based economy in the world". Under the motto "Global Partnership", there is a separate focus on the external dimension of sustainability – combating worldwide poverty.

Perspectives for Germany

The implementation of the European objective at national level defines the Federal Government's 2002 sustainability strategy under the title "Perspectives for Germany". In this, the Federal Government defines sustainability as an interdisciplinary task that is to be a fundamental principle in its policy in all fields in future. On the whole, the strategy formulates guiding principles of sustainable action for the key areas of energy, transport, health protection and food, family and old age, education and innovation. There is a separate focus on combating poverty, fostering development and worldwide environmental and resource conservation. The recommendation to understand sustainability as a locomotive for innovation and to face up to the challenges of globalisation and structural change with a sustainable way of doing business is addressed at companies (www.bundesregierung.de).

Local Agenda 21

Numerous German local authorities together with several thousand cities and communities throughout the world are on the way towards a local agenda. The trigger for this movement was the final Rio document of 1992, the Agenda 21. This global programme of action for sustainable development was signed with binding effect by most countries on earth – including Germany. The document portrays demands for sustainable development at national and international level. Furthermore, local authorities all over the world are called upon to develop their own programmes of action in the form of "Local Agendas".

By now, agenda processes referring to individual towns and cities have been set in motion in practically all German cities (www.agendaservice.de). In the Scandinavian countries and the United Kingdom, programmes of action of this kind have not just been drawn up for towns and cities, but also for the majority of rural local authorities.

What is Sustainability?

The term "sustainability" is much older than its current popularity would lead us to believe. In fact, the history of sustainability goes back to Saxony in the baroque age. In Freiberg in around 1700, Chief Inspector of Mines Carl von Carlowitz developed a counter model to the severe degradation of forests practised until then. To conserve the wood resources in the long run, he recommended that only so much wood should be felled as could grow back through reforestation. However, a definition of sustainability of this kind, only relating to type and quantities of resources, can no longer meet modern, ecologically-based perceptions of careful use.

Sustainability Triangle "Ecology, Social Affairs & Economy"

In 1992, industrialised and developing countries agreed in Rio on the confirmation of the future goal of global, sustainable development. Since the "Rio plus ten" follow-up conference in Johannesburg (2002) at the latest, this goal has been defined so that it goes beyond the mere maintenance of the

ability of the ecological system to function. Much rather, the objective includes the idea – also assuming social, ethical and economic dimensions – of a life with human dignity based on individual self-development, both for the current and future generations. What is essential about this definition is that it understands sustainable development as an interdisciplinary task that basically affects all areas of society equally and that it sets a clearly future-oriented emphasis with responsibility for future generations (BUNDESREGIERUNG 1999, ENQUETE-KOMMISSION 1998, HABER, W. 1998 b).

In this general definition, the term sustainability has experienced very broad social and political approval. However, it is not operable in this form. Consequently, the time after Rio has been characterised by intensive efforts to define the term more precisely and take it into account in decision-making processes. Some things have been achieved, but much has been left open to this day, not only in detail, but also in fundamental issues.

Fig. 2: UNESCO World Heritage cultural landscape "The rice terraces of Ifugao/ Philippines": Sensitive use of nature...

... for future generations (Batad, Philippines)

Box 2: Perspectives for Sustainability

The sustainability approach aims at bringing together economic performance, social responsibility and environmental protection to facilitate fair development opportunities for all countries and to preserve the natural foundations of life for future generations. Currently, throughout the world there are around 70 attempts to bring this guiding principle ("regulative idea") closer to operationalisation. Examples include:

- *If the ecologists have their way, the ecosystems should not be overtaxed by a use of its resources.*
- *Most economists view sustainable development as an economic form that has to ensure that the same welfare will be available for future generations as for those of today.*
- *Physicists call for the conservation of biological systems that are stable within themselves, and chemists would like all anthropogenically influenced substance cycles to be closed where possible (i.e. "recycling").*

Particularly drastic examples of non-sustainable economies are

- *deforestation in the Mediterranean area by the Romans and the destruction of tropical forests today,*
- *overfishing of the oceans by ever more perfect catching techniques and*
- *steppisation of large parts of the former Lake Aral in Russia as a consequence of the diversion of large quantities of water to irrigate agriculture.*

Examples of sustainable economic development are harder to find, especially if not all forms of economic activity that owe their permanence only to the low levels of technical intervention in the past are to be called sustainable. In principle, the following types of economic activity can be considered sustainable:

- *cultivation of centuries old rice terraces in China and South-East Asia,*
- *various forms of agricultural forest use (agro-foresting) in Africa and Latin America and*
- *cultivation of Alpine pastures from the 17th century to the end of the Second World War.*

Open Questions and Attempts to Solve Them

The past discussion on sustainability is overloaded with a number of ideological interpretations that do not stand up to rational examination. Behind this are fundamental values that automatically lead to communication problems if the individual point of view is not indicated sufficiently clearly. Some general related problems refer to:

1. Economics, social sciences and ecology (nature conservation, see below) interpret the term of sustainability in very different ways. To this day there is no really shared basic understanding of what sustainable action could be.

2. Interpretations of the sustainability principle are not infrequently supported by the (not openly expressed) ideal of a "life in harmony with nature". In this connection, frequent references are made to historical cultures or indigenous peoples who would come relatively close to this ideal. Many historical economic systems, however, were by no means ecologically sustainable, but have sometimes even led to the extinction of the culture in question due to predatory exploitation and overuse. In the case of indigenous peoples in obviously semi-natural regions, the main question to be adressed is the extent to which their traditional ways of living and working correspond to modern ideas of social sustainability (cf Chapter 3.1.1).

3. Broad circles, not just in the general public and among politicians, start from the erroneous assumption that there are solutions where economic, social and ecological interests can be given equal maximal consideration at the same place. However, the development of sustainability strategies always means that a compromise or a balance for different interests will be found in a process. On the one hand, possible solutions can be integrating concepts at the same place, but on the other hand the spatial separation of priorities ("priority areas"; integrating and segregating strategies, see below).

4. The specific application of the sustainability principles therefore not least depends on the area levels that are selected. There are no generally valid "patent solutions" that can be applied one-to-one to various local situations. Sustainability concepts for Europe or Germany must be designed differently than those at regional or local authority level and solutions that were developed at one place cannot be transferred to others until they have been adapted.

5. The lack of a precise definition of sustainability is often justified with the lack of scientific data. This is certainly not wrong. However, data, no matter how precise, will never "automatically" lead to useful solutions. Just as important are standardising and thus explaining normative steps, based on value principles, in the form of agreements between various interest groups. Thus, for example, sustainability strategies should also consider the interests of future generations. But to how many generations should this apply and who, in the case of doubt, has priority, the living or the future generations? Scientific data do not provide an answer to this. Solutions must be found between different points of view and interests, and the way or methodology how to achieve these must be understood by everybody. Any form of use, however we imagine it, changes nature and, also, human's social environment. Sustainable development of humankind and "untouched nature" do not go together (irrespective of this, society can consciously decide not to use certain areas, maybe for reasons of nature conservation or because there are no economic perspectives of use). But how much nature is still sustainable and what are the indicators for the relevant nature quantities and qualities? Here, too, research results do not provide an "automatic" decision. Sustainable development must be the result of a comparison of societal values and consensus. This valuing dimension of sustainability still is not treated accordingly in many discussions.

6. Sustainability thus mainly means rethinking values and developing new forms of decision-making for everyday problems. The latter is also necessary because the conventional decision-making processes are optimised to guidelines that cannot be harmonised with the idea of sustainability (e.g. preferring short-term technical progress over the long-term safeguarding of development, making decisions on the basis of scientific facts without considering questions of values, placing individual interests above those of the community and future generations). Agenda 21 initiatives are certainly a pioneering element for this. Yet they alone are not enough. Their efforts will have only few effects as long as they are trapped by the conventional thinking of policy and economics on the use of nature. Sustainability does not thus arise solely from scientific data, but mainly in the hearts and minds of those people who decide about their own futures and those of their children.

The Pillars of Sustainability

Nature Conservation

In the last few years a growing gap has opened up between the public perception and the scientific concept of nature conservation. The main reasons for this are:

1. Increasingly, conventional species and ecosystem conservation is perceived as the sole field of work (discussions on ecosystem mapping, nature conservation areas and the Habitats Directive of the European Union). But nature conservation comprises all natural commodities, including the so-called abiotic ones, such as water and soils. It pursues a nationwide, spatially and thematically differentiated concept of aims and has always included a future-oriented develop-

ment strategy that considers human usage interests through landscape planning (cf IUCN definitions, Box 1 and Article 1 of the Federal German Nature Conservation Act). The sustainable development of nature and landscapes has long been a central issue for nature conservation (PLACHTER, H. 1991).

2. In recent years, the practical everyday work of nature conservation has increasingly returned to static and preserving protection strategies that tend to look backwards and to biotic-oriented commodities. This is certainly a direct consequence of the continuing losses of and interventions in nature. But this cannot mean that the other fields of activity are neglected in the long term due to a lack of capacities and/or low public acceptance. Above all, there is a lack of new ideas and practicable approaches for these fields of activity (SRU 1996, 2000).

3. Ecology and nature conservation are largely placed on an equal footing in terms of content. However, whereas ecology is an empirical science, nature conservation is a valuing, results-oriented action discipline (ERZ, W. 1986). Ecology and nature conservation have a relationship with each other similar to that between biology and human medicine or between physics or chemistry and the engineering sciences. Consequently, nature conservation needs a broad extra spectrum of methods that ecology does not deliver, e.g. in the fields of value identification, value comparison, decision-making and planning (PLACHTER, H. et al. 2002).

Nature conservation can in no way mean only the conservation of intact nature or nature that has been influenced by humans as little as possible. Agricultural ecosystems also function without any problems in the scientific sense. Much rather, the difference is that they are artificially kept stable by means of constant human influence, especially in the form of energy and substance inputs, and often have greater negative impacts (especially for humans themselves) than natural ones. Nature conservation has several "basic motives", including the protection and development of biodiversity, the stability of natural systems, unique natural creations, the conservation of wild species and natural ecosystems, and the development of systems of use adapted to nature (PLACHTER, H. 1999). For the discussion about sustainability, it is decisive that the character (and thus, ultimately, the "value") of these basic motives are positively related to each other only in very specific cases and in a few places on earth. Some tropical forests and large coral reefs are natural, biologically diverse, stable and unique, all at the same time. In most other cases, the characters of the individual basic motives do not depend on each other. Many natural ecosystems are extremely poor in species and/or are not very stable. In many places on earth – for example in Central Europe – humans have greatly increased biological diversity over time in comparison to the natural state in ways that, by modern standards, are far from being "sustainable" (cf Fig. 1). Early land use forms in Europe were

Fig. 2: Historical landscape, Central Swabian Alb 1936: fields in the valley bottom, overgrazed oligotrophic limestone grassland (Source: Schenkel Archive, LfU Baden-Württemberg)

Fig. 1: A landscape east of Zadar, Croatia that has been overused for 2,000 years. The options for future generations were spoiled.

by no means "extensive" in terms of use of labour and exhaustion of natural resources, as is often claimed today. Nevertheless, many of the ecosystems that arose in that way, such as oligotrophic grasslands, grazed woodland or heaths, are considered to be of prime importance for conservation today due to their high biodiversity and their landscape aesthetics (cf Fig. 2).

This means that there can be no single, uniform "sustainability indicator" for the field of ecology. Which basic motive is to have priority over the others in which place has to be decided in individual cases and ultimately – with all of the help from scientific data – by setting normative standards. Above all, "nature conservation" means maintaining the diversity of nature in all of its aspects. But these differ from place to place. The enormous wealth of nature on this earth is the result of the differences between locations. Politics and the administration, however, aim at general, simple guidelines that can be applied with legal certainty everywhere. It is this in particular that entails the great danger of levelling out differences in locations – and thus lowering diversity – instead of fostering them. "Ecological sustainability" can only be developed in relation to areas and subject matter. A worldwide network of "model regions", in which conservation and development strategies adapted to locations are developed, is the key logistical foundation for this.

The contribution of nature conservation to a sustainability strategy cannot exhaust itself in a sporadic, conserving method of protecting species and semi-natural ecosystems nor in a call for the reintroduction of pseudo-extensive historical forms of land use (note: the majority of so-called contractual nature conservation strategies pursues precisely this goal). Nationwide concepts, pioneering ideas and – above all – a placing of value on natural commodities that is transparent to the public are required. In this sense, environmental protection primarily aimed at human health is ultimately only a partial component of a more comprehensive strategy for the protection of an intact nature (= environment).

Economy

The central task of human economic activity lies in creating economic value by means of entrepreneurial activities. Economic activity, however, is not only for the short-term maximisation of profits, but also for the satisfaction of human needs and, thus, the provision of livelihoods for all individuals (cf box 3). In the long term, the economic component of sustainable development can therefore be described as an economic form that has to ensure that the same welfare will be available for future generations as for those of today. The strategic goal of sustainable development should therefore be to develop products and services for the future markets of a society with a sustainable economy.

Box 3: Economic Approaches for Sustainability

- *Encourage innovations for the development of ecological products and markets!*
- *Cooperate or form networks in the product line or to change the market!*
- *Use the opportunities presented by regional structures by buying materials and products from the region!*
- *Use potentials for cost savings by means of ecological and social measures in the company (e.g. reducing sickness costs)!*
- *Invest in projects that are economically, ecologically and socially meaningful!*
- *Conduct fair competition on the market!*
- *Pay salaries and wages in line with collective bargaining or typical for the sector!*
- *Encourage ecological and social projects, for example by means of donations or sponsoring!*

(Bundesumweltministerium/Umweltbundesamt 2001)

Social Aspects

What is decisive for the standardising process of sustainable development is that none of the three dimensions of ecology, economy or social affairs may be individually optimised, but that a solution should only ever be sought and found involving and considering the other two components.

Whereas there are still relatively rounded provisions for the ecological dimension, as a sustainable, protective and wise use of natural resources, and the economic dimension, as the means of satisfying needs for current and future generations by means of economic development, this is not the case for the social dimension. The core of the social dimension is the safeguarding of equity and equality of opportunity within the generation existing today (e.g. balance between North and South, but also West and East now) and between the present and future generations. This equalisation, also called the intergenerational agreement, concerns equity within a generation in the first case and equity between different generations in the second case. If these aspects are considered, we also talk about "socially compatible" ecological and economic development. However, the social dimension goes far beyond this definition of terms.

There are differences even in the names for the social dimension: it is often called "socio-cultural" in order to emphasise the culturally specific differences and characteristics (e.g. in comparison between the North and the South). In other cases, the cultural dimension is considered to be the "fourth leg" of a chair (cf Chapter 3.1.1), which must not wobble at all. But

the cultural dimension is also seen as a dimension encompassing the three main dimensions because it is cultural schemes, values and practices that structure and link the three dimensions of sustainability and weigh them up against each other. Others add "participation" as the fourth leg and use it to refer to a procedure related to the three contents.

The term "sustainable development" is often criticised as ambiguous and "fuzzy" and a precise definition is demanded. However, it is precisely the relatively broad interpretation scope that offers a way in for many areas of policy and many scientific disciplines. Nevertheless, the concept of sustainability forces the overcoming of sectoral and departmental boundaries and a merger – or at least a debate with – such different scientific disciplines as the natural, economic and social sciences. Without this integrative concept of sustainable development, cooperation of this kind would not come about so easily.

Furthermore, it is essential for the shaping of sustainable development that sustainable development only makes sense as a **global** process that, however, can be realised only **locally** in the region (natural and cultural space). The term "glocalisation" is starting to establish itself for processes of this kind (Charniawska, B. 2003). In spite of advancing globalisation, in spite of necessary global framework conditions, it is becoming ever clearer that the local level of action plays a major role, both as the origin for global development and as the location of the impact of global developments on the local population and on natural resources.

The role of people as **shapers and sponsors** of sustainable development will be moved to the fore. Not only biosphere reserve managers, but also and above all the various individuals and interest groups involved (players, stakeholders) in a biosphere reserve must help to make decisions, support and, ultimately, implement the various forms and characteristics of protection and use. The prerequisite for this is that all of these players should be interested and actively involved. This, in turn, presupposes profound knowledge of the predominant individual and socio-cultural values, the subject areas with potential for conflict, the motivation structures, the responsibilities and the conditions for further action that can be effective as obstacles or as potential in the process of social change towards sustainable development.

This means that the social dimension of sustainable development includes all individual, social and culturally specific conditions that are relevant for the human-nature and/or human-environment relationship. This relationship is largely built upon and co-determined by the importance of nature for every individual person. This subjective importance is based on traditional knowledge in society (e.g. indigenous knowledge), individual belief systems (nature cannot be destroyed at all) and collective ideas (neem trees are worshiped in many parts of India and are therefore protected) and it is influenced and changed by continuous social communication, whether direct from person to person or via the media. That is why it makes sense to design biosphere reserves as "social-ecological units".

Vision and Reality

Currently (September 2003) 440 biosphere reserves have been recognised by UNESCO in all parts of the world. What contribution have they made to the basic ideas of the MAB Programme and to the political guiding principle of sustainability? There is still no systematic analysis of what has been achieved in biosphere reserves. The "periodical reports", compiled every ten years for every biosphere reserve according to the MAB Programme and have also been compiled for the German biosphere reserves since 2001, provide information about the level of development. However, it will probably be a few years yet until a worldwide image can be derived from these reports. To date, 97 countries have become involved in the Programme. The biosphere reserves cover an area of approximately 45.1 million square kilometres (425 biosphere reserves, as of June 2003). Almost all of the biosphere reserves have their own staff of state employees.

In 1971, the ideas of the MAB Programme were so innovative that at first there were only vague conceptions of how to realise them. In the early days in particular, therefore, biosphere reserves were often established in outstanding natural areas without any significant human population or land use. Not infrequently, there were existing national parks or even Category I wilderness areas under the World Conservation Union (IUCN), such as the Amboseli National Park in Africa or the Yellowstone National Park in the USA. The recognition of the German national parks of the Bavarian Forest and Berchtesgaden as biosphere reserves also dates back to this time. In the former Soviet Union "biosphere zapovedniki" are a separate statutory category of protected area. The core area of the established areas there is relatively big and very well protected, meaning that the total area often come very close to IUCN category II (national parks).

Nevertheless, the existing system of biosphere reserves is much more than another category of large-scale protected areas. The principles of the Seville Strategy of 1995 once again made this very clear and adapted the MAB Programme to the current discussion about sustainable development (German MAB National Committee 1996).

All biosphere reserves have spatial zoning, usually comprising a core area, a buffer zone and a transition area. It is especially the strictly protected, unused core area that has repeatedly given cause for misunderstandings on the concept and goals of biosphere reserves. The idea of developing sustainable ways of nature utilisation by people in biosphere reserves is obvious and convincing. But is it also credible if there are simultaneous demands to totally remove a certain proportion of the land from any human use? This could give rise to the suspicion that nature conservationists strive to use