

UNESCO's Role in the Conservation of Mountain Resources and Sustainable Development

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Abstract

This paper presents an overview on UNESCO's activities in the field of conserving mountain resources and promoting sustainable development through two of its major programmes: the Programme on Man and the Biosphere (MAB), and the World Heritage Convention. The MAB Programme, launched in 1971, is an international environmental research and conservation programme to study and improve the relationship between people and their environment. It promotes environmental conservation with sustainable use of resources. Governed by an International Coordinating Council of 34 States, the MAB Programme counts today 144 national committees with field and programme activities in over 110 countries. The former MAB project area 'Human impact on mountain and tundra ecosystems' has given rise to numerous integrated mountain research projects. With its focus on biosphere reserves, the MAB Programme is now promoting environmental conservation objectives with a human-centred approach. The World Heritage Convention, for which UNESCO provides the Secretariat, protects the world's most outstanding natural sites in mountain environments. Its prestige and visibility promote tourism in mountains with potential benefits to local people, but may also entail threats to fragile mountain ecosystems if appropriate management plans are not worked out or respected. The case of the Yellowstone World Heritage site illustrates how the Convention's mechanism of 'Danger Listing' may reduce adverse impacts on the integrity of the site.

Key words: biosphere reserves, conservation, environment, Man and the Biosphere (MAB) Programme, mountains, World Heritage

1. Introduction

As stipulated in UNCED *Agenda 21*, fragile ecosystems have unique features and resources. They include deserts, semi-arid lands, wetlands, small islands, certain coastal areas, and mountains (UN Department of Public Information: *Agenda 21: Programme of Action for Sustainable Development*, UN, 1994, page 98). Apart from their characteristic landforms and geomorphology, such particular features in mountains are often endemic and rare plant and animal species, which make them particularly interesting for conservation. As regards natural resources, water, but also timber and mineral ores derive from many mountains. However, these unique features of mountains and their natural resources are at stake when people are compelled to exploit fragile ecosystems rather than to conserve them because of poverty constraints. In fact, mountain dwellers not only live in peripheral areas, they are often also marginalized in economic terms. The dilemma of conserving natural resources and at

the same time providing for an income to mountain people through the use of natural resources for economic purposes in a sustained manner is addressed by UNESCO through two different, though sometimes interrelated international instruments: the *World Network of Biosphere Reserves* and the *World Heritage Convention*. The United Nations Educational, Scientific and Cultural Organization (UNESCO) provides the international secretariats for these two instruments. While biosphere reserves and natural World Heritage sites have been designated in virtually all biomes and ecosystems of our planet, a significant high number of these sites exist in mountains. This paper introduces the concept and provides information on the functioning of biosphere reserves as well as of World Heritage sites.

2. The World Network of Biosphere Reserves

The World Network of Biosphere Reserves is a

part of UNESCO's Programme on Man and the Biosphere (MAB). This international research programme aims at studying and developing a basis, within the natural and social sciences, for the sustainable use and conservation of biological diversity, and for the improvement of the relationship between people and their environment. The MAB Programme encourages interdisciplinary research, demonstration and training in natural resource management. MAB contributes thus not only to better understanding of the environment, including global change, but to greater involvement of science and scientists in policy development concerning conservation and wise, rational use of natural resources (see the mission statement of the MAB Programme at <http://www.unesco.org/mab/about.htm>).

When the MAB Programme came into existence over 30 years ago, it was designed around a total of fourteen MAB Project Areas (see box). It is noteworthy that the MAB Programme incorporated an ecosystem approach where the impact of human activities on a given ecosystem was of central interest.

Many mountain scholars of world renown (such as Jack Ives & Bruno Messerli) have been very closely involved with the shaping and development of MAB Project Area 6, the 'Impact of human activities on mountain ecosystems' and have worked in later years very closely with the United Nations University while also always keeping in contact with UNESCO's MAB Programme activities (Schaaf, 1995).

Over the last decade (since 1991), the MAB Programme has placed more emphasis on the conservation of natural resources and sustainable development reflecting also the spirit and type of thinking of the United Nations Conference on Environment and Development in Rio de Janeiro (1992). To this effect, the World Network of Biosphere Reserves has experienced an ever growing success with currently (June 2006) 482 biosphere reserves in 102 countries (see the

URL address <http://www.unesco.org/mab/BRs.shtml>) for a brief description of the concept, site locations and year of inscription, with a short description of each site). While in the 1980s and 1990s some 10 to 15 sites were proposed for biosphere reserve designation world-wide on an annual basis, 20 to 30 new site proposals have reached the international MAB Secretariat annually since the late 1990s. Many governments seem to have realized that the 'biosphere reserve tool' allows them to promote economic development while at the same time working toward environmental conservation, the importance of which is emphasized.

In fact, the central question inherent in all biosphere reserves is the following: how can we conserve the environment (e.g., mountain ecosystems) while at the same time ensuring sustainable development for people? Or, how can we reconcile the conservation of biological resources with their sustainable use? In essence, biosphere reserves aim at resolving land use conflicts by working out holistic environmental and economic management plans that provide protection to natural resources while allowing for economic activities — in a sustainable manner — for people living in biosphere reserves. Unlike most other protected areas, biosphere reserves take a people-centred approach, where solutions on sustainable land management are worked out among local stakeholders, scientists and government officials and are based upon scientific spatial analysis.

According to their shortest definition, biosphere reserves are areas of terrestrial ecosystems which are internationally recognized within the framework of UNESCO's Man and the Biosphere (MAB) Programme (see UNESCO-MAB, 2000: Biosphere Reserve Map, Paris, France). Collectively, they constitute the World Network. They are nominated by national governments and must meet a set of criteria and adhere to a set of conditions before being admitted into

Box: The Fourteen MAB Project Areas from 1971 – 1991

1. *Ecological effects of increasing human activities on tropical and subtropical forest ecosystems.*
2. *Ecological effects of different land uses and management practices on temperate and Mediterranean forest landscapes.*
3. *The impact of human activities and land use practices on grazing lands: savanna and grassland (from temperate to arid areas).*
4. *The impact of human activities on the dynamics of arid and semi-arid zones' ecosystems.*
5. *Ecological effects of human activities on the value and resources of marshes, rivers, deltas, estuaries and coastal zones.*
6. ***The impact of human activities on mountain and tundra ecosystems.***
7. *The ecology and rational use of island ecosystems.*
8. *Conservation of natural areas and of the genetic material they contain.*
9. *Ecological assessment of pest management and fertiliser use in terrestrial and aquatic ecosystems.*
10. *Effects of man and his environment of major engineering works.*
11. *Ecological aspects of urban systems with particular emphasis on energy utilization.*
12. *Interactions between environmental transformations and the adaptive, demographic and genetic structure of human populations.*
13. *Perception of environment quality.*
14. *Research on environmental pollution and its effect on the biosphere.*

the World Network. Each Biosphere Reserve is supposed to fulfill three basic functions, which are complementary and mutually reinforcing (Schaaf, 1999):

- a conservation function - to contribute to the conservation of landscapes, ecosystems, species and genetic variation;
- a development function - to foster economic and human development which is socio-culturally and ecologically sustainable;
- a logistic function - to provide support for research, monitoring, education and information exchange related to local, national and global issues of conservation and development.

To carry out these complementary activities of nature conservation and use of natural resources, biosphere reserves are organized into three interrelated zones, known as the core area, the buffer zone and the transition area (Fig. 1).

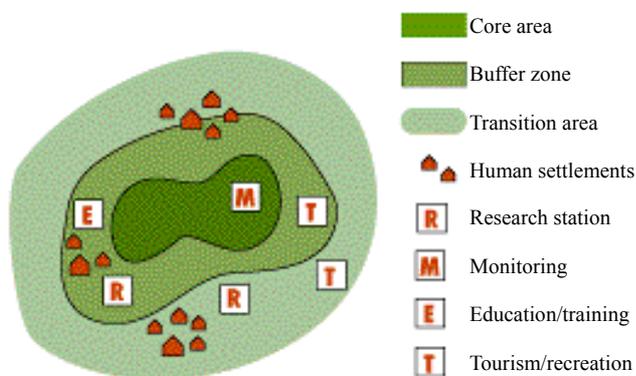


Fig.1 Schematic zonation of a biosphere reserve.

- The **core area** needs to be legally established and gives long-term protection to the landscape, ecosystem and species it contains. It should be sufficiently large to meet these conservation objectives. As nature is rarely uniform and as historical land-use constraints exist in many parts of the world, there may be several core areas in a single biosphere reserve to ensure a representative coverage of the mosaic of ecological systems. Normally, the core area is not subject to human activity, except research, monitoring and, as the case may be, traditional extractive uses by local communities.
- A **buffer zone (or zones)** which is clearly delineated and which surrounds or is contiguous to the core area. Activities are organized here so that they do not hinder the conservation objectives of the core area but rather help to protect it, hence the idea of 'buffering.' It can be an area for experimental research, for example to discover ways to manage natural vegetation, croplands, forests and fisheries, and to enhance high quality production while conserving natural processes and biodiversity, including soil resources, to the maximum extent possible. In a similar manner, experiments can be carried out in the buffer zone to explore how to rehabilitate degraded areas.

- An **outer transition area**, or area of cooperation extending outwards, which may allow a variety of agricultural activities, human settlements and other uses. It is here that the local communities, conservation agencies, scientists, civil associations, cultural groups, private enterprises and other stakeholders must agree to work together to manage and sustainably develop the area's resources for the benefit of the people who live there. Given the role that biosphere reserves should play in promoting the sustainable management of the natural resources of the region in which they lie, the transition area is of great economic and social significance for regional development.

Although presented schematically as a series of concentric rings, the three zones are usually implemented in many different ways to accommodate local geographic conditions and constraints. They can have multiple core areas and buffer zones which in turn are surrounded by the transition area marking the boundary of the entire management site. This flexibility allows for creativity and adaptability, and is one of the greatest strengths of the concept.

The World Network is formally recognized by UNESCO's 191 Member States. UNESCO's intergovernmental structure gives the MAB Programme the potential to help national governments support the planning and implementation of environmental conservation, research and training programmes. This association focuses on the most urgent needs of countries as defined by their own scientific community and decision-makers. Thirty-four countries are represented in the International Co-ordinating Council of the programme. MAB National Committees (mostly under the ministries of the environment or other similar government bodies) have been established in 144 countries, comprising decision-makers, natural and social scientists, and environmental conservation specialists. Currently, there are MAB Programme activities in over 110 countries around the world. The programme, therefore, provides an immense network for information exchange on mountain conservation and sustainable development.

The following examples of mountain biosphere reserves will illustrate the coupling of environmental conservation and sustainable resource use (Schaaf, 1997).

In the 'Manu Biosphere Reserve' (reaching 4,000 m) in Peru, rural development in the buffer zone around the protected areas is considered essential for the viability of conservation measures. Known as the 'Manu Project' and led by the 'Peruvian Foundation for the Conservation of Nature' since 1989, it emphasizes the development of sustainable agricultural systems and health and education services for settlers (mainly Quechuas from the highlands) and indigenous Amazonian people living in the buffers zone. The development of ecologically sustainable agriculture

minimizing the use of pesticides was introduced, and this helped to produce better quality crops and reduce health hazards for the farming communities. In turn, human pressure (poaching, illegal cultivation of crops) on the National Park which is the biosphere reserve's core zone, was reduced.

In southwestern China, the Xishuangbanna Biosphere Reserve with its highest peak at 2,429 m is often called the 'kingdom of biodiversity.' With more than 200 species of butterflies throughout the forests of Xishuangbanna, butterfly farming has become an important economic asset and an option for sustainable development for and species conservation by local people. Ethnobotany as a discipline in China originated in Xishuangbanna: plant ceremonies, flower-eating, use of plants for communication, and knowledge of herbs by the reserve's minorities (especially the Dai people) are currently being studied.

Many biosphere reserves in mountains also act as 'hubs' for conservation, research and development. The 'Southern Appalachian Biosphere Reserve' in the USA covers parts of six federal states. Under the auspices of the Southern Appalachian Man and the Biosphere (SAMAB) programme, research projects include the reintroduction of the red wolf into Great Smoky Mountains National Park and a habitat assessment for neo-tropical migratory birds. The biosphere reserve cooperative is successfully promoting public awareness through development of educational material for schools and public education programmes.

In Eastern and Central Europe transborder collaboration in mountain biosphere reserves on species inventorying and management issues has become one of the main foci in recent years in reserves such as the 'Krkonoše/Karkonosze Biosphere Reserve' of the Czech Republic and Poland, the 'East Carpathian Biosphere Reserve' covering territories of Belarus, Poland and Slovakia, and the 'Tatra Biosphere Reserve' bordering Poland and Slovakia. While national boundaries are marked by these mountain ranges, wildlife and plant management necessitates collaboration beyond national boundaries, thus responding to the holistic management concept of biosphere reserves.

3. The World Heritage Convention

UNESCO's second international legal instrument for the conserving natural resources and promoting income-generation for mountain dwellers is the *Convention concerning the Protection of the World Cultural and Natural Heritage*. As with the MAB Programme, UNESCO also provides the international Secretariat for this legal Convention, which to date (June 2006) has been signed and ratified by 182 State Parties.

The World Heritage Convention has been created to protect humanity's most valuable immovable treasures. In fact, there is a set of places that are of such

outstanding universal value that their deterioration or destruction constitutes a loss to the heritage of *all humanity*, not just to the country in which it is located. These cultural and natural places make up the *world's heritage*.

Threats to the world's heritage became increasingly apparent during the 1960s, such as through the flooding and loss of the Nubian monuments under the Aswan High Dam (Egypt) and the recurrent floods and rising water in Venice (Italy) damaging buildings and frescoes. Independent moves to create international instruments for the protection of cultural heritage by UNESCO and ICOMOS, and of natural heritage by IUCN coalesced with an initiative to form a single international, legal instrument.

In 1972, the World Heritage Convention was adopted by the UNESCO General Conference and was subsequently opened for ratification by countries. In 1975, the Convention became operational. The first natural sites were inscribed in 1978 (such as the mountain sites Nahanni National Park, Canada; Yosemite National Park, USA; and Simen National Park, Ethiopia), which coincided with the adoption of the first Operational Guidelines, a text that would complement the Convention text for its sustained practical implementation. While the first twenty years of the Convention saw only the inscription of either 'cultural properties' (such as India's Taj Mahal in 1983) or 'natural sites' (such as Hawaii Volcanoes National Park, USA, in 1987) or 'mixed sites' which combine natural and cultural values (*e.g.*, the Historic Sanctuary of Machu Picchu, Peru, in 1983), the year 1992 provided a new impetus for the Convention through the designation of 'cultural landscapes' that would reflect the interaction of man and nature. It is noteworthy that the first cultural landscapes that were inscribed or re-inscribed under this new category were sacred mountains: Tongariro National Park in New Zealand (1993) and Uluru-Kata Tjuta in Australia (1994) (Rössler, 1994, and Plachter & Rössler, 1995).

The World Heritage Convention seeks to identify and protect the world's heritage through a system of collective assistance and cooperation. In essence, it intends to compliment, not replace, the actions of State Parties to the Convention, since it is always the primary role of the country itself to safeguard the treasures on its national territory.

Article 2 of the Convention stipulates the criteria for nominating natural sites. As with cultural properties inscribed on the list, they should be of outstanding universal value from an aesthetic or scientific point of view, representing physical, geological and biological formations (see URL <http://whc.unesco.org/archive/convention-en.pdf> for the text of World Heritage Convention).

In addition to the World Heritage Convention text itself, operational guidelines have been developed that further stipulate criteria for the inscription of natural world heritage sites. A site can be inscribed on the

world heritage list if it is an outstanding example representing major stages of earth's history, or if it represents significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals; or it contains superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance; or if it contains significant natural habitats for *in situ* conservation of biological diversity (see Operational Guidelines for the Implementation of the World Heritage Convention at <http://whc.unesco.org/archive/opguide05-en.pdf>).

The World Heritage Convention is implemented by a 21 member Committee of State Parties meeting yearly. An executive-like World Heritage Bureau meets twice a year. The Committee and Bureau are supported by a Secretariat, the World Heritage Centre, provided by the Director-General of UNESCO; technical support and advice are provided by NGOs: IUCN (for natural sites), ICOMOS as well as by ICCROM (for cultural sites).

It is important to note that only a State Party can nominate a site on its territory. The nomination of the site can be justified on the basis of cultural heritage, natural heritage or a combination of the two. Qualities of the site are assessed against a set of criteria (see above) developed by the Committee. A site must satisfy at least one criterion to be inscribed; additionally, a site must satisfy associated conditions of integrity (for natural heritage) or tests of authenticity (for cultural heritage).

To-date (June 2006), the World Heritage Committee has inscribed 812 properties on the World Heritage List, of which there are 628 cultural sites; 160 natural sites; and 24 mixed properties in 182 States Parties.

Since most properties inscribed on the World Heritage List are major tourism destinations, they generate income for local people in the tourism sector and related industries. In fact, the inscription of a site is not only an immense prestige for a country, but constitutes a considerable economic interest for the entire region where the site is located. Observations have shown that the number of visitors at a given World Heritage site has increased tremendously due to the inscription of the site under the World Heritage Convention. The income deriving from tourism can, therefore, provide an important development factor for local mountain people, if the benefits are shared equally among the tourism sector and mountain dwellers living in or close to the World Heritage site.

However, some mountain sites also face serious constraints, be it because increasing number of visitors jeopardize the fragile ecosystem of the mountains, be it because the cultural integrity of mountain people is at stake when confronted with new, often alien, impacts of 'lowland cultures' that penetrate 'highland cultures.' The World Heritage Convention disposes of an instrument that alerts the international community

to any threats that may impact negatively on a world heritage site: the 'danger listing.' The World Heritage Committee may list a site on the List of World Heritage in Danger if it feels that it is threatened by a serious and specific danger:

- (a) Ascertained danger: a manifest danger to the integrity of the site that is specific and imminent;
- (b) Potential danger: a threat that may develop and threaten a site, such as a reduction in protective regime.

Danger listing is the first step in the process to remove sites that have lost or are potentially losing their *outstanding universal value* from the World Heritage List. The following example illustrates how a mountain site has been subject to danger listing.

Yellowstone National Park (USA) is often considered the world's oldest national park, as it was designated thus as early as 1 March 1872, and conceptually speaking, its designation gave rise to the 'national park concept.' In June 1976, Yellowstone National Park became a biosphere reserve under the UNESCO MAB Programme, and in September 1978 it was designated as a World Heritage site for its natural attributes meeting all four natural heritage criteria (see above).

As regards 'geological and geomorphological aspects,' Yellowstone provides a record of volcanism with continuous roots to the Eocene period, it is the world's largest geothermal basin, it has more thermal features than the world combined (over 300 geysers and over 10,000 other thermal features), it has 27 fossil forests and an abundance of Pleistocene glaciation features.

With regard to 'ecological and biological aspects,' Yellowstone is still considered an undisturbed area allowing for continued development and evolution of biological entities with natural processes. Its elevational differences have produced a wide range of different plant communities ranging from semi-arid steppe to alpine tundra. Finally, Yellowstone has important habitats for large free-ranging mammals, including bison, bears, ungulates and carnivores.

Under the 'aesthetics and natural beauty' criterion, Yellowstone features superlative hydrothermal phenomena (such as Old Faithful geyser, Mammoth Hot Springs), and it contains a grand canyon and waterfalls of the Yellowstone River, many of which have been created by edges of lava flows. It is also a composite of a plateau surrounded by high mountains, with an altitudinal range from Reese Creek (1,610 m) to Eagle Peak (3,462 m).

In light of the fourth criterion ('biodiversity and threatened species'), Yellowstone accounts for 290 species of birds, 58 mammals, 13 fish, 6 reptiles, 4 amphibians and some 1,100 vascular plants. Moreover, it contains a unique assemblage of thermal algae and bacteria, as well as many threatened species such as the peregrine falcon, bald eagle, grizzly bear and mountain lion.

However, in July 1993, the World Heritage Bureau took note of a report that expressed serious concerns about the integrity of the park and the site was listed on the 'danger list' in 1995 (Rössler, 2000). What had happened?

Yellowstone National Park is the core area of a much larger ecosystem with Grand Teton National Park in the south and a series of state forests with multiple-use functions that act as a buffer zone (in 1976, this bigger area was designated a biosphere reserve). However, the buffer zone is only as effective as its management permits and in 1993, the US Government notified the World Heritage Committee (via the UNESCO World Heritage Centre) of threats to Yellowstone National Park. This report was bolstered in 1995 by a coalition of US environmental organizations that requested the World Heritage Committee to place the site upon the List of World Heritage Sites in Danger. One of the problems emanated from an underground gold, silver and copper mine that operated about 4 km northeast of Yellowstone National Park (i.e. in an unprotected area). Concerns included the permanent impoundment of tailings on site requiring diversion of a creek. Leakages or catastrophic failure would impact on waterways through acid-rock leachates. The maintenance and building of all-weather access roads would open up areas of the park that had previously limited winter access, and the increased local population would place greater demands upon the local environment.

UNESCO reacted to the expressed concerns by dispatching a high-level monitoring mission to consult with the various stakeholders involved in Yellowstone: representatives of government agencies, the parks service, proponents of the mine, local people and a whole range of NGOs representing both conservation and development interests were interviewed. Interestingly enough, the mission not only ascertained the threat of the mine but also highlighted additional threats, including bison management, introduction of non-native fish, growing levels of tourism, acid leachates from old mining sites as well as road construction. Approximately 2,500 bison in three herds exist in the area, and these migrate to lower altitude areas outside the park, particularly during harsh winters when forage is low. In doing so, they may potentially transmit brucellosis to domestic cattle and create property damage in farm lands. As a response to these threats, current bison management involves capture and slaughter of bison crossing the north and west boundaries of the park (1,100 bison had to be slaughtered during the very harsh winter of 1996/1997).

Great concern was also raised with regard to tourism and the question was put forward: are Americans loving Yellowstone to death? While in the winter of 1963/64 only some 1,000 visits were counted, this figure had risen to over 100,000 during the winter of 1982/83, and to some 143,000 visits during the winter 1993/94 (these figures relate both to Yellowstone and

Teton National Parks). Increased tourism entails a wide range of problems, including resource degradation, increased air, noise and water pollution, crowding and reduced visitor experience, and the previously developed management plans had not counted upon such a meteoric rise in visitation, particularly during the winter season.

Finally, non-native trout have been illegally introduced into Yellowstone Lake and related waterways, which effectively compete with a sub-species, the endemic Yellowstone Cut-throat trout. Reductions in cutthroat trout populations may cause disruptions to food supplies of the threatened grizzly bear and the endangered bald eagle among other fauna.

On the basis of both ascertained dangers and potential dangers, the Committee decided to place Yellowstone National Park on the List of World Heritage in Danger and have the Committee request continuing reports on the results of the EIS (environmental impact study) and mitigating actions being taken to ensure in due course the removal of the site from the List of World Heritage in Danger (World Heritage Committee, Berlin, December 1995).

The 'danger listing' of Yellowstone had some remarkable effects. In August 1996, the New World Mine Agreement was signed providing for the acquisition by the US of the mineral rights owned by Crowne Butte mining company. Based on the EIS, federal lands in the Cooke City area were removed from mineral entry in August 1997 (although pre-existing entitlements and mining on private land were not affected). In order to respond to the bison problem, the National Academy of Sciences undertook a six month study of brucellosis in the Greater Yellowstone Area in 1997, and a state/federal interagency 'Greater Yellowstone Brucellosis Committee' was established. A bison management plan was released for public review in June 1998 with options ranging from allowing bison to range freely over a large portion of public land inside and outside the park, to management through controlled hunting outside park boundaries, and attempts to eradicate brucellosis by capturing, testing and slaughtering infected bison. Also in the field of tourism management, some important measures were taken: the Parks Service and other land managers have commenced addressing the winter tourism issue by working out a winter visitor use management plan, which would cover both Yellowstone and Teton national parks. While it may prove difficult to eradicate the invasive 'Judas' trout, attempts are being made to control the invasive fish by intensive gill netting.

As this example has shown, the UNESCO World Heritage Convention and its mechanism of danger listing demonstrates the potential of the Convention to focus attention internationally and domestically on threats to a listed site. In fact, the situation was advantageous to the US Parks Service as it was able to argue for extra financial resources for the management of

this mountain site. The threat initiating the danger listing, the mine proposal, was effectively removed within 18 months. Despite this act, Yellowstone National Park has been retained upon the danger list until the other identified threats have been removed, but the sustained danger listing has maintained a focus on the integrity of Yellowstone, and has expedited responses to those threats.

This case has also shown that buffer zones around World Heritage sites are required as a component of the site's conditions of integrity, and that the biosphere reserve concept with its multiple use zones can greatly complement World Heritage sites. However, as Yellowstone National Park has demonstrated, the existence of a buffer zone doesn't necessarily ensure the site's integrity. The wider transition zones of biosphere reserves must also come into play and the larger regions surrounding a World Heritage site must be managed to ensure the continuing integrity of the site.

Many protected areas in mountains of the world have similar problems, as the conservation of mountain resources is often detrimental to economic development. While blueprint solutions do not exist for every protected site, be it a World Heritage site or a biosphere reserve, the sharing of information and expertise through coordinated efforts and management such as through UNESCO may help in addressing conservation and development issues and may give positive results that satisfy environmentalists and developers alike. Fragile mountain environments must be conserved for future generations, but they should also be carefully and sustainably used for those living today, so as to reduce further marginalization of mountain people.

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