

WILDLIFE AND TOURISM IN FOREST ECOSYSTEMS

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Contents

1. Introduction

1.1. The difficulty of valuation

1.2. Conservation of ecosystems

2. Wildlife

2.1. The economic value of wildlife resources

2.2. Factors threatening wildlife use

2.3. Approaches to sustainable wildlife use

3. Tourism

3.1. The value of forests for tourism

3.2. Tourism – conserving the tropical forests?

3.3. Conservation tourism

Glossary

Bibliography

Biographical Sketch

Summary

Wildlife is one of the most important resources provided by forest ecosystems. In the tropics alone, hunting is an ubiquitous activity on which 200-300 million forest-dwelling people are directly dependent for part or all of their livelihood and food. However, the abundance of wildlife has declined in many tropical forest areas, which jeopardizes the nutritional base on which local communities depend, and threatens the ecological integrity of the tropical forests. Given the importance of wildlife resources, the implementation of sustainable management approaches is thus an imperative issue. Wildlife is also important in tourism. In tropical forests, rare, dangerous, or colorful animals represent a major travel motive, even though the significance of these forests for recreation, education, and experiences is now growing in general. Mid-latitude forests in industrialized countries serve as buffer zones from daily urban life, and in countries such as Austria, Switzerland, Sweden, or New Zealand, they are a central element of the landscapes that attract millions of foreign tourists each year. In these countries, recreational pressure on forest ecosystems has increased substantially.

Tropical forests face rapid decline, indicating that the use of forest resources is increasingly driven by the immediate benefits that arise from their uses. With the rising interest in visiting rainforests, tourism and its high use-value has become an increasingly important incentive for conservation. However, in the light of the complex effects tourism has on the environment and the local communities visited, the

implementation of tourism should be seen as a measure to buy time in order to establish alternative strategies addressing the larger problems lying behind ecosystem destruction.

1. Introduction

Wildlife is one of the most important resources provided by forest ecosystems all around the world. In the tropics alone, hunting is an ubiquitous activity on which 200-300 million forest-dwelling people are directly dependent for part or all of their livelihood and food. In recent years, the abundance of wildlife has declined in many tropical forest areas as a result of increased commercialization and market integration, increased access to remote forest areas, growing human populations, increasing demand for wild meat from urban centers, more effective hunting technologies, and changes in hunting practices and settlement patterns of forest-dwelling people. The loss of wildlife jeopardizes the nutritional base on which local communities depend and can lead to the collapse of local economies. Moreover, it threatens the ecological integrity of the tropical forests. Given the importance of wildlife resources, the implementation of sustainable management approaches is thus an imperative issue.

Wildlife is also important in tourism. In tropical forests, rare, dangerous or colorful animals represent a major travel motive, even though the significance of forests for recreation, education and experiences is now growing in general. Mid-latitude forest resources in industrialized countries serve as buffer zones from daily urban life, and in countries such as Austria, Switzerland, Sweden or New Zealand, they are a central element of the landscapes that attract millions of foreign tourists each year. With increasing demand for outdoor recreation, visitors to natural areas put substantial stress on forest ecosystems. As both tourism and wildlife populations are ultimately dependent on intact forest ecosystems, the importance of maintaining their integrity is clearly rendered prominent. In the light of this, the article analyzes the development of tourism and the situation of wildlife resources from a socio-economic and ecological perspective. Suggestions for the sustainable use and conservation of forests are made. Focus is on the tropical forests, because these face rapid decline, while an increasing number of people continue to be directly dependent on the resources they provide.

1.1. The difficulty of valuation

It has been pointed out by many scientists that the effective management of biological resources cannot avoid addressing issues of economic value, even realizing its ethical limitations. In fact, there is growing evidence that management and conservation efforts will only be successful if they have a direct, utilitarian value to the people involved. Following this insight, an economic perspective is applied throughout the article. It should be noted, though, that economic approaches to conservation have also been criticized: valuing ecosystems does not consider that the value of the life-supporting services these provide is, for obvious reasons, infinite. Moreover, it has been argued that current methods of valuation accept and validate the alienation of people from ecosystems. This paper takes the position that the human economic system has to be seen as a dependent subsystem of the biosphere, which makes it necessary to preserve a substantial share of the global ecosystems in a functional state.

In economic theory, biological resources have use values (which may be direct or indirect, current or future) and non-use values (bequest and existence value). The direct use value derives from their direct role in consumption and production. The indirect use value stems from biodiversity's life-supporting role. The option value is the value a resource might have in the future. The existence and bequest value derive from altruism toward non-human and human users, respectively. The direct use values of forests include timber and non-timber products, medical plants, plant genetics, wildlife, and tourism. Note that in contrast to the use of wildlife resources, tourism is considered to be a non-consumptive activity. Indirect use values include soil conservation and productivity, material cycling, watershed protection, flood control, microclimatic regulation, buffering disease/pest spreading, and carbon sequestration.

At present, direct use values tend to dominate decisions about the use of forest resources, while indirect values are rarely taken into account for reasons that range from the difficulty of quantification and valuation of their public good aspects as well as insecure property rights (market failure) to governmental incentives for conversion and inconsistent land use policies (policy failure). In consequence, the most unsustainable use of forests, clear-cutting, is the most economical one, which has contributed in particular to the destruction of the tropical rainforests.

1.2. Conservation of ecosystems

The current debate regarding the conservation of ecosystems follows two basic lines of discussion: one view is that a substantial part of the ecosystems should be safeguarded in fully protected areas excluding any human use, while the other advocates conservation compatible uses based on the idea that economic incentives (i.e., a continuous flow of income from an area) will lead to the preservation of ecosystems. However, virtually no forest ecosystem has remained unaffected by human use, and conservation can therefore hardly be discussed in isolation from issues of utilization. Indigenous peoples, for instance, inhabit more than 85 per cent of the protected areas in Central America and more than 80 per cent of the protected areas in South America. Worldwide, traditional peoples might inhabit nearly one-fifth of the earth's surface. The question will thus in most cases not be whether or not to use ecosystems, but how to move from systems overexploiting the resource base to systems that are sustainable.

2. Wildlife

In most tropical countries, government forest policy is primarily concerned with the utilization of timber resources. For people living in or bordering forests, however, non-timber forest products, in particular wildlife, are of far greater importance. It is estimated that between 200-300 million people in the tropics alone earn part or all of their livelihood and food from forests. These people frequently rely for over 50, and in remote areas for up to 90 percent of their protein on wildlife. Wildlife also provides a range of important materials such as fats, oils, waxes, fuel, cosmetics, perfumes, medicines, and poisons, as well as materials used for construction, weapons, music instruments, clothing, and ornaments.

In dense forests, where raising livestock is difficult and where it is impossible for economic reasons to import from outside, hunting is the best way of obtaining animal protein. In general, all species larger than one kilogram, and sometimes even smaller, are harvested. The consumption of wildlife from tropical forests is substantial. The subsistence harvest in the Brazilian Amazon alone, for example, is estimated at 67 to 164 million kg per year, representing 9.6 to 23.5 million mammals, birds and reptiles, notably tapir, *agouti* and *paca* (rodents of Amazonia), peccaries (wild pigs), monkeys, snakes, and lizards. Available data suggests that daily per capita intake of game meat by forest dwellers is high and regular: a study in Cameroon, for instance, found that 226-238 g of animal meat were eaten daily during two-thirds of the year, indicating an annual per capita demand of meat in the order of 53-60 kg. Overall, tens of millions of animals and millions of metric tons of meat might be hunted and consumed each year across the tropics.

2.1. The economic value of wildlife resources

Even though primarily a means of subsistence in tropical forest settings, meat and wildlife materials are increasingly sold in markets and represent a major source of cash income to local communities. The distinction between subsistence and commercial hunting is difficult, because many subsistence hunters will sell a portion of their game. In some cases, only surplus harvest is sold, while in others, game is traded for goods which would otherwise have to be purchased. In the table presented below (Table 1), estimates from different scientific sources of the economic value of wildlife resources are presented, based on the assumption that a ready market exists. Values are given for sustainable yields of wildlife and represent net values.

Income from wildlife	Value (\$ ha⁻¹yr⁻¹)
<u>Sustainable yield of wildlife (net values)</u>	
Caimans and primates, Amazon, Ecuador	330.00
Wildlife, Amazon, Ecuador	120.00
Bushmeat, Amazonia, Brasil	40.00
Bushmeat, Sarawak, Malasia	12.00
Wildlife, Sarawak, Malasia	8.00
Wildlife, Central African Republic	3.50
Prized game meat, Ituri Forest, Republic of Congo	0.50-3.00
Wildlife in tropical developing countries	0.38
Game production, Switzerland	6.06

Table 1. The economic value of wildlife

Overall, the annual value of wildlife resources harvested per hectare of rainforest might range between \$0.38 and \$120.00. Higher values might be yielded from resources that can be marketed internationally, such as caimans and primates. For example, the value of a sustainable yield of these species in the Ecuadorian Amazon has been estimated at \$330.00 ha⁻¹yr⁻¹. The value of wildlife sold on local markets will be lower, though, and basically ranges between \$3.50-40.00 ha⁻¹yr⁻¹. Overall, the value of wildlife will be

dependent on the socio-economic conditions of the area in question, availability of marketable species, and access to markets.

Wildlife is of virtually no importance for subsistence in industrialized countries, even though it has a substantial market value. For example, data provided for Switzerland suggests that the wildlife harvested in 1994 had a value of roughly \$7.3 million, which translates into \$6.06 per hectare of forest land.

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Biographical Sketch

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