

Prospects and Directions for the Development of Ecotourism in the Context of Conservation of Biological Diversity

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Abstract

This article presents a comprehensive study of the economic aspects of ecotourism development within the context of biodiversity conservation. The significance of this study lies in the increasing global human pressure on ecosystems and the need to find sustainable management models capable of achieving economic benefits without compromising the environmental integrity of regions. The study aims to propose a system of economic mechanisms and management strategies that promote harmony between ecotourism development and biodiversity conservation. The methodological framework includes a literature review, a comparative geographical approach, cognitive modeling of socio-economic processes, and a scenario-based approach. The study analyzed various types of regions, ranging from mountainous and border areas to protected natural areas. The results showed that the effective development of ecotourism requires a shift from a comprehensive model to a more intensive one, based on service quality and visitor flow management. Key economic tools include differential pricing, the establishment of eco-clusters, the introduction of a public-private partnership mechanism for infrastructure financing, and a system of compensation payments and investments for ecosystem rehabilitation. Particular attention was given to the role of ecotourism in raising environmental awareness, which contributes to changing consumer demand and forms the basis for the sector's long-term sustainability. Based on the analysis, practical recommendations were made to improve the regulatory framework, promote responsible business practices, and develop effective regional strategies that balance economic and environmental priorities.

Keywords: Ecotourism, Biodiversity conservation, Economic mechanisms, Sustainable development, Recreational pressure, Environmental awareness, Tourism management

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1. Introduction

The current stage of socioeconomic development is characterized by an intensifying conflict between humanity's growing demand for recreational resources and the fragility of the natural systems that sustain them. At the same time, biological diversity, the foundation of biosphere stability and a source of enormous economic value in the form of ecosystem services, is under unprecedented threat. Therefore, the search for economic models that not only minimize damage but also promote the preservation and restoration of natural capital is becoming imperative. At the same time, ecotourism, conceptually focused on responsible travel to natural areas, appears to be one of the most promising forms of such symbiosis.

According to the definition approved by the International Ecotourism Association (TIES), ecotourism is defined as “responsible travel to natural areas that conserves the environment, supports the well-being of local people, and includes educational and outreach activities” involving all stakeholders, including personnel (The International Ecotourism Society, 2015). Thus, the key features of ecotourism should be the following:

- Developing tourist routes through natural landscapes in their pristine state, with maximum respect for natural and cultural sites and minimal anthropogenic interference;
- Protecting ecosystems and preserving local cultural traditions, customs, sites, etc.;
- Pursuing educational and awareness-raising goals;
- Promoting improved well-being of the local population;
- Fostering environmental awareness and responsibility.

2. Research Methods

In modern times, environmental protection, rational use of natural resources, and ensuring the socio-economic well-being of local communities are considered one of the main directions of sustainable development. In this regard, ecotourism is of strategic importance as a form of tourism based on nature, carried out without harming the ecological balance and aimed at strengthening the economic opportunities of the local population.

The main feature that distinguishes ecotourism from other types of tourism is that it promotes the interaction of people with nature and, in this process, is based on the principle of minimal impact on the cultural and ecological environment. This form of tourism is aimed at ensuring that tourists and tourism operators contribute to environmental protection, as well as to the socio-economic well-being of local communities. As a result, ecotourism is not only a means of environmental protection, but also an important element of the sustainable development of natural areas.

The strategic goal of ecotourism is to achieve sustainable development or to form practical mechanisms to achieve this goal. This approach includes, for example, issues such as reducing ecological footprints, directing the obtained economic resources to nature conservation, and raising environmental awareness among the population. In this context, Lindberg and colleagues present ecotourism in a more general form as “a type of sustainable tourism and recreation based on nature”. In their approach, the sustainability of tourism is associated with the creation of positive and lasting effects in the experience of tourists, along with balancing ecological, socio-cultural, and economic impacts.

The existence of numerous definitions of ecotourism shows that this field is still not fully systematized from a theoretical and practical point of view and is in a developmental stage. Therefore, in order for each definition to be considered comprehensive and complete, it is important that it reflects the fundamental principles that constitute the essence of ecotourism. These principles show that ecotourism is not only an activity focused on nature, but is also based on the integration of social, economic, and ecological aspects.

- Protection of the biological diversity of natural recreation areas;
- Increasing the level of economic sustainability of regions involved in the field of ecotourism;
- Improving the ecological culture of participants in ecotourism activities;
- Maintaining the ethnographic status of recreational areas.

As a result, one of the main features of ecotourism is that this form of tourism, while satisfying the need for people to interact with nature, aims to minimize negative impacts on the environment and cultural heritage. At the same time, tourists and tourism organizers participating in ecotourism activities are encouraged to actively contribute to environmental protection, as well as to the socio-economic development of local communities.

Ecotourism is today considered one of the main mechanisms contributing not only to the protection of nature, but also to the socio-economic development of surrounding areas at the global level. In most of the definitions of ecotourism presented in various sources, it is clearly seen that it is directly linked to sustainable development. The concept of sustainability in this context is understood, first of all, in the sense of ensuring an optimal and long-term balance between the ecological, socio-cultural, and economic impacts of tourism activities. In addition, the positive interaction and behavioral patterns of ecotourists among themselves also play an important role in maintaining this balance.

Thus, ecotourism is not only a type of recreational activity, but also an important tool that promotes the efficient and responsible use of natural resources, supports ecological balance, and regional sustainable

development. This approach shows that environmentally sustainable, economically efficient, and socio-culturally inclusive forms of tourism can be evaluated in the context of more sustainable tourism models.

For a better understanding of this type of tourism, the 10 rules of ecotourism formulated by TIES are as follows (The International Ecotourism Society, 2015):

- Remember that the Earth is fragile;
- Leave no trace behind, only take pictures;
- Learn about the environment you are in: the culture of the people, the geography;
- Respect the local population;
- Do not buy products from manufacturers who pose a threat to the environment;
- Travel only on well-trodden paths;
- Join environmental protection programs;
- Use environmental protection methods wherever possible;
- Maintain relationships with organizations that help protect the environment;
- Travel with the help of companies that support the principles of ecotourism.

Over the past 20 years, the demand for ecotourism has been growing at an average annual growth rate of 10–15%. The main reasons for this growth are shown in Figure 1.

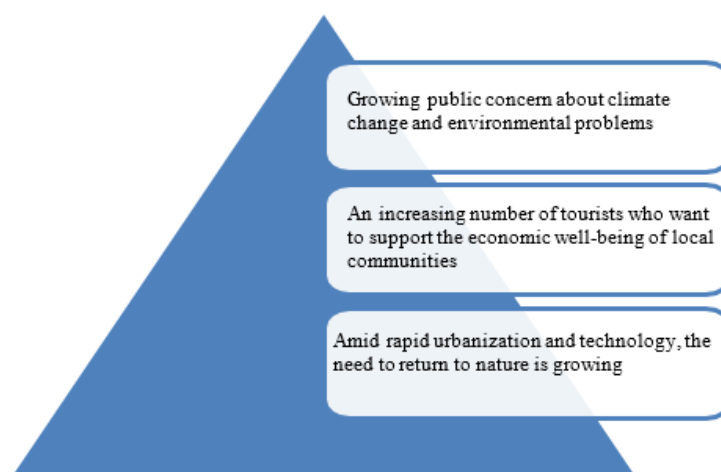


Figure 1. Factors leading to the development of ecotourism.

As can be seen from the figure, the development of ecotourism is influenced by the increasing public concern about climate change and environmental problems, the increasing number of tourists who want to support the economic well-being of local communities, and the increasing need to return to nature against the backdrop of rapid urbanization and technology.

As public interest in environmental problems has increased in recent years, ecotourism has become one of the most important directions of sustainable tourism. This form of tourism has become a relevant field on a global scale, based on the principle of protecting natural resources, improving the well-being of local communities, and minimizing environmental impact. In this study, the dynamics of the development of ecotourism on a global scale from 2015 to 2025 are reflected in the statistical indicators in Table 1.

Table 1. Dynamics of the development of ecotourism in 2015–2025.

Year	Tourist trips	The share of ecotourism	Note
2015	1.21 billion	90 million (7–8%)	The beginning of rapid development
2018	1.41 billion	150 million	Growth continues
2019	1.51 billion	170 million (>10%)	Highest levels
2020 (Pandemic)	400 million	40 million	74% reduction (UNWTO, 2022)
2021	500 million	60 million	Partial recovery
2023	1.31 billion	180 million	Post-pandemic growth
2024	1.41 billion	200 million	Development of new trends
2025	1.51 billion	230 million	Development of new trends

Source: Compiled by the authors based on the State Statistical Committee (2025).

As can be seen from the table, data for 2015–2025 show that ecotourism has increased in dynamics in the global tourism sector and is now forming not only as an alternative, but also as a direction of strategic importance (UN Tourism). Although a serious decline was observed during the pandemic, the recovery process accelerated in subsequent years, and forecasts for 2025 indicate that ecotourism will fully recover and exceed previous levels. These trends confirm that ecotourism will develop as a sustainable and priority area in future tourism models. In addition, the table below reflects the countries in which ecotourism is developing most regionally.

Table 2. Regional development dynamics of ecotourism.

Continent	Main countries	2015–2019	2020–2021	2022–2025
Asia	Nepal, India, Malaysia	Increase in Himalayan trekking routes	Closures due to the pandemic	Restoration digitalization
Europe	Switzerland, Norway, Germany	Green infrastructure development	Sharp decline in visitor numbers	Development with a green deal
Afrika	Kenya, Tanzania, Rwanda	Safari tourism is booming	Safari activity has stopped	Community-based recovery initiatives
North America	Canada, USA	Growth in the national park system	Access to parks is restricted	Carbon-neutral tours and service
South America	Costa Rica, Peru, Brazil	Rise in the Amazon and Andes	Visits to reserves have decreased	Eco-certified tourism growth
Australia & Oceania	Australia, New Zealand	Tourism growth around the Great Barrier Reef	Hard closure	The “Nature Positive Tourism” program is being implemented

Source: Compiled by the authors based on UN Tourism.

The indicators reflected in the table demonstrate that the ecotourism sector has gone through different stages of development on all continents during the period 2015–2025. During this period, the sector initially developed with stable growth dynamics, but in 2020–2021, it experienced a serious decline at the global level due to the impact of the COVID-19 pandemic. However, since 2022, it has been observed that the sector has begun a gradual recovery process and that the previous upward trends have gradually reformed.

The following are the main basic principles of ecotourism (Tussyadiah et al., 2020):

- Protection of the biological richness and diversity of recreational natural areas;
- Increasing the economic sustainability of the regions where ecotourism is carried out;
- Implementing necessary measures to improve the cultures of participants engaged in ecotourism activities;
- Preservation of the ethnographic characteristics and status of recreational areas.

The above-mentioned basic principles of ecotourism can be illustrated in more detail through the following diagram.

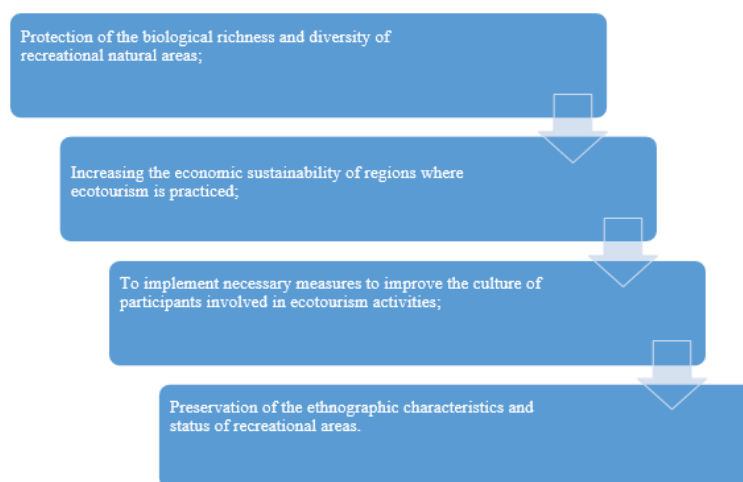


Figure 2. Basic principles of ecotourism.

Source: Compiled by the authors based on The International Ecotourism Society (2015).

At this stage, various regions have entered the recovery process with initiatives aimed at sustainability, for example, green infrastructure (Europe), community-based initiatives (Africa), carbon-neutral tours (North America), and digital innovations (Asia). These data show that ecotourism is no longer just an alternative form of tourism but has also become one of the main drivers of the strategic and sustainable development of global tourism.

In the Republic of Azerbaijan, several state programs, legislative initiatives, and local and international projects have been implemented over the last 15 years to develop ecotourism (ecotourism). The “Strategic Roadmap for the Development of the Specialized Tourism Industry in the Republic of Azerbaijan” was adopted by the decree dated December 6, 2016 (President of the Republic of Azerbaijan, 2016). The main provisions of this strategic roadmap are shown in Figure 3 below.

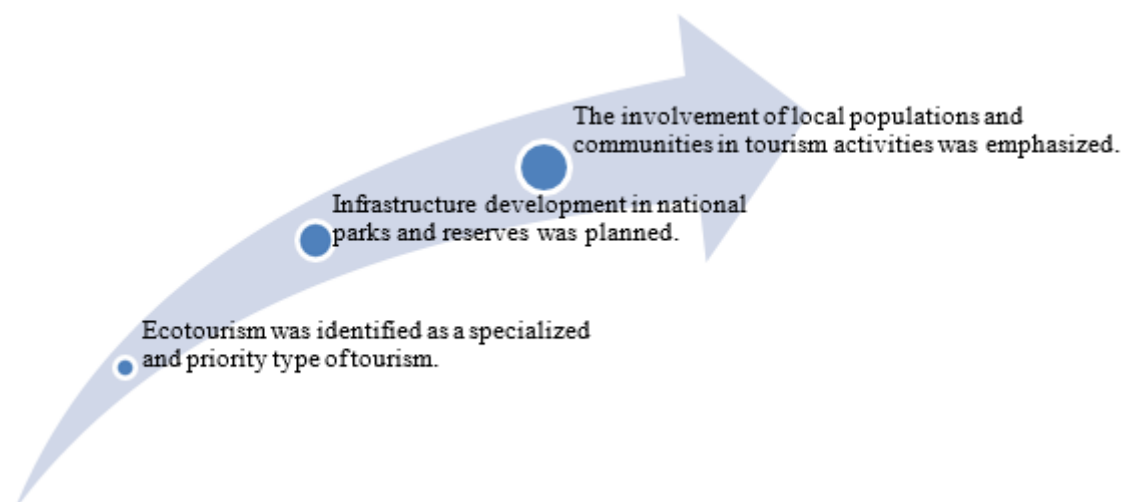


Figure 3. Strategic roadmap for the development of the specialized tourism industry in the Republic of Azerbaijan: main provisions of ecotourism.

Source: Compiled by the authors based on the President of the Republic of Azerbaijan (2016).

The points reflected in the visual material show that ecotourism is considered both an object of thematic specialization and a priority area for development at the national level. In this context, the improvement of the material and technical base of national parks and reserves, as well as the active involvement of local communities in tourism processes, are among the main target areas. Also, since 2003, 10 national parks have been established in Azerbaijan by the Ministry of Ecology and Natural Resources to develop ecotourism. National Parks are reflected in Table 3 below (Ministry of Ecology and Natural Resources).

Table 3. National Parks of the Republic of Azerbaijan.

Name	Location	Year of establishment	Total area, hectares
Absheron National Park	Baku, Khazar district	2005	783
White Lake National Park	Agjabedi, Beylagan district	2003	17.924
Goygol National Park	Dashkesan, Goranboy, and Goygol districts	2008	12.755
Shahdag National Park	Ismayilli, Gabala, Guba, Gusar, Oghuz, and Shamakhi districts	2006	130.508
Altiagach National Park	Khizi district	2004	11.035
Hirkan National Park	Lankaran and Astara districts	2004	40.358
Zangezur National Park is named after Academician Hasan Aliyev	Ordubad district	2003	42.797
Shirvan National Park	Gardagh, Salyan, and Neftchala districts	2003	54.374
Samur-Yalama National Park	Khachmaz district	2012	11.772
Gizilaghaj National Park	Lankaran, Masalli, and Neftchala districts	2018	99.060

Source: Compiled by the authors based on the State Statistical Committee (2025).

As can be seen from the table, the system of national parks, established to protect Azerbaijan's ecosystems and develop ecotourism, covers various natural and geographical regions of the country and has been formed consistently since 2003; currently, 10 main national parks operate in the country (Ministry of Ecology).

The Tourism Agency has developed new programs covering the years “State Program for the Development of Tourism (2022–2026)”. The main measures are as follows (State Tourism Agency).

- Assessment of the ecotourism potential in Karabakh and East Zangezur;
- Digitization of ecological nature routes;
- Creation of community-based tourism support funds;
- State support mechanisms for green infrastructure.

The development of ecotourism in Azerbaijan has been carried out gradually and in stages. A model based on state policy, non-governmental initiatives, and the participation of local communities is being formed. This area is expected to expand further with the opening of the Karabakh region to tourism.

Environmental sustainability is reducing the impact of tourism activities on natural resources and ecosystems. It governs the principles of:

Resource conservation: The use and conservation of natural resources such as water, energy, and land. This can be achieved by reusing water in tourism facilities, increasing energy reserves, and using renewable energy sources.

Pollution reduction: The treatment of air, water, and land pollution, waste management, and recycling programs. For example, the principle of “reduce, reuse, recycle” is applied to reduce solid waste.

Biodiversity conservation: The maintenance of rare and endangered species and the protection of their habitats. This seeks to protect the biodiversity of these areas from being threatened by the creation of areas and the development of ecotourism activities in these areas.

Landscape conservation: The preservation of the aesthetic ecological value of natural and cultural landscapes. This requires the design of construction and infrastructure projects in an environmentally friendly manner.

3. Conclusion

Ecotourism possesses distinctive characteristics that should be clearly understood. After all, simply going to nature for the purpose of recreation is not ecotourism. The main criterion of ecotourism is the fact that it contributes to the preservation of wild nature and does not harm it. Organized streams of tourists are controlled and distributed in such a way as not to harm natural ecosystems. In addition, ecotourism contributes to education: it gives people information about natural objects, the animal and plant life of this area, shows the beauty of nature, and emphasizes the importance of its preservation, not because of imposed restrictions, but because of conscious motivational activity. Another important condition of ecotourism is the economic component; it increases the well-being of the local population, gives new jobs, and allows you to open a business based on sustainable nature management.

The most popular ecotourism is in specially protected natural territories (OOPT); an important reason for this is that the corresponding infrastructure is created on these lands, and ecological paths are laid.

Among the advantages of ecotourism, in our opinion, the following circumstances should be considered:

1. Ecotourism makes it possible to receive non-monetary income by means of increasing legal culture and legal awareness, ecological education and upbringing, understanding the need to preserve natural objects for future generations;
2. Ecotourism is carried out within the borders of specially protected natural territories, which allows concentrating efforts to preserve natural landscapes and natural resources;
3. Ecotourism provides the local population with the opportunity to get work and income from the sale of natural products produced by them, from the sale of handicrafts;

4. Organized ecotourism attracts a large number of tourists, which implies the development of tourist infrastructure and the attraction of financial investments.

The advantages of ecotourism stimulate the subjects of entrepreneurial activity to further develop and improve tourist services, to implement together with the local population projects to create new workplaces.

Ecotourism is an effective measure of ensuring the sustainable use of natural resources. The study of theoretical and practical problems of ecotourism allowed the formulation of proposals concerning the ways of their resolution through the functioning of specially protected natural territories, which realize the goals of the concept of sustainable development and provide a balance of ecological, economic, and social interests.

Ecotourism is a type of active recreation that helps visitors restore their physical and mental well-being. Thus, ecotourism has a clearly expressed recreational character.

Ecotrails and routes are the most visited objects of environmental and educational activities and educational tourism in state nature reserves and national parks.

Author Contributions

All authors approved the final manuscript.

Conflict of Interest

The authors declare no conflicts of interest.

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