



Ecotourism as a Tool for Biodiversity Conservation: From Tourism Revenue to Ecosystem Restoration and Resilience

Shabnam Pangtu^{1,2*}, Ashutosh Sharma² and Sonika Sharma²

¹Dept. of Floriculture and Landscaping, Dr. Yashwant Singh Parmar University of Horticulture and Forestry, Nauni, Solan, Himachal Pradesh (173 230), India

²Faculty of Agricultural Sciences, DAV University Jalandhar, Punjab (144 012), India



Open Access

Corresponding Author

Shabnam Pangtu

✉: negi.shabnam0007@gmail.com

Conflict of interests: The authors have declared that no conflict of interest exists.

How to cite this article?

Pangtu, S., Sharma, A., Sharma, S., 2026. Ecotourism as a Tool for Biodiversity Conservation: From Tourism Revenue to Ecosystem Restoration and Resilience. *Biotica Research Today* 8(9), 165-167.

Copyright: © 2026 Pangtu *et al.* This is an open access article that permits unrestricted use, distribution and reproduction in any medium after the author(s) and source are credited.

Abstract

Ecotourism has emerged as a sustainable tourism approach that seeks to reconcile nature-based recreation with biodiversity conservation and local development. Unlike conventional mass tourism, ecotourism emphasizes responsible travel, environmental education, low-impact activities and the sustainable use of natural resources. Its contribution to conservation occurs through several pathways, including the generation of revenue for protected areas, support for wildlife protection and habitat restoration, promotion of environmental awareness and creation of economic incentives for conserving natural resources. However, ecotourism is not automatically sustainable. Uncontrolled visitor numbers, infrastructure development, waste generation, resource consumption and carbon emissions can create ecological pressures and undermine conservation objectives. Experiences from Costa Rica, the Galápagos Islands and Kenya demonstrate both the opportunities and management requirements associated with ecotourism. Increasing use of GIS, remote sensing and community-based approaches can further improve monitoring and conservation outcomes. Thus, scientifically planned and effectively managed ecotourism can contribute to biodiversity protection, ecosystem restoration and long-term ecological resilience.

Keywords: Biodiversity, Ecosystem, Ecotourism, Sustainable tourism

Introduction

Ecotourism is a specialized form of tourism involving responsible travel to natural areas while promoting environmental conservation, local community welfare and environmental education. Its fundamental principle is to obtain the benefits of nature-based tourism without degrading the ecosystems on which tourism depends. Sustainable ecotourism therefore seeks to minimize environmental impacts while generating economic and social benefits that encourage conservation. Appropriate strategies include controlled visitor numbers, eco-friendly infrastructure, waste reduction, sustainable transport and conservation-oriented tourism activities.

Ecotourism and Biodiversity Conservation

Biodiversity conservation is one of the central objectives of ecotourism. Natural landscapes, forests, wetlands, wildlife

habitats and protected areas attract visitors because of their biological richness and uniqueness. When tourism generates income from entrance fees, guided tours, accommodation and related services, part of this revenue can support conservation activities such as wildlife protection, habitat restoration, research and protected-area management (Goodwin, 1996).

Ecotourism can also create economic incentives for protecting habitats and species. Areas containing rare, endemic or endangered species can acquire greater economic value when their natural resources are maintained rather than converted to alternative land uses. This may encourage protection of habitat corridors, reduction of deforestation and conservation of species-specific habitats. However, these benefits depend strongly on effective management. Poorly regulated tourism can disturb wildlife,

Article History

RECEIVED on 15th September 2026

RECEIVED in revised form 24th September 2026

ACCEPTED in final form 26th September 2026

damage vegetation and contribute to biodiversity loss (Huynh et al., 2025).

Ecotourism as a Source of Conservation Financing

One of the important contributions of ecotourism is its capacity to generate financial resources for conservation. Revenue from tourism can be reinvested in protected-area management, anti-poaching activities, habitat restoration and community development. The Kenya case demonstrates the potential of tourism-associated income to support wildlife protection and community-based conservation initiatives. Similarly, tourism in the Galápagos Islands contributes to conservation activities directed towards the protection of its distinctive biodiversity.

The economic valuation of ecosystem services provides another mechanism for demonstrating the importance of natural ecosystems. Services such as carbon sequestration, clean water, biodiversity and habitat provision have economic significance and recognizing this value can strengthen arguments for ecosystem protection. Thus, ecotourism can connect the economic value of natural landscapes with practical conservation investment.

Ecosystem Restoration and Ecological Resilience

Ecotourism can contribute not only to preventing biodiversity loss but also to restoring degraded ecosystems. Revenue generated through tourism may support reforestation, habitat restoration, species protection and other conservation activities. Restoration improves ecological functions and can

strengthen ecosystem resilience against environmental pressures (Baloch et al., 2023).

Ecotourism also promotes awareness of ecosystem services and biodiversity. Visitors who receive environmental information through guided tours and interpretation programs can develop greater understanding of conservation issues. Such experiences can encourage responsible behaviour and support for conservation beyond the tourism destination.

Ecological Footprints and Conservation Trade-offs

Despite its conservation potential, ecotourism has direct and indirect ecological footprints. Direct impacts include energy and water consumption, waste generation, infrastructure development, soil disturbance and wildlife disturbance. Indirect impacts include carbon emissions associated with transportation, introduction of invasive species and increasing demand for food, materials and other resources (Gossling et al., 2002).

Overtourism presents a particular challenge. Excessive visitor numbers can cause soil erosion, habitat degradation, pollution and resource depletion. Infrastructure development in environmentally sensitive areas may further undermine conservation objectives. Consequently, the designation of an activity as “ecotourism” does not itself guarantee environmental sustainability (Table 1). Visitor limits, environmental standards, monitoring and effective regulation are necessary to maintain ecological balance.

Table 1: Ecotourism contributions to biodiversity conservation

Conservation aspect	Role of ecotourism	Example
Conservation financing	Entrance fees, guided tours and eco-lodging can generate funds for conservation.	Galápagos, Kenya
Wildlife protection	Tourism revenue can support anti-poaching and wildlife management.	Maasai Mara, Kenya
Habitat restoration	Funds can support habitat restoration and ecosystem recovery.	Conservation areas
Biodiversity conservation	Responsible tourism can provide incentives to protect biodiversity.	Costa Rica
Environmental education	Guided interpretation and direct nature experiences improve conservation awareness.	Guided ecotours
Ecosystem resilience	Restoration and community participation can strengthen ecosystem resilience.	Coastal island communities

Evidence from Selected Case Studies

1. Costa Rica

Costa Rica provides an important example of the relationship between ecotourism and biodiversity conservation. National parks and protected areas have supported tourism while generating economic incentives for maintaining natural ecosystems. Research in Manuel Antonio examined changes in land use and biodiversity in relation to ecotourism and conservation (Broadbent et al., 2012).

2. Galapagos Islands

The Galápagos represents a highly sensitive destination characterized by unique and endemic biodiversity. Tourism

management and conservation programs have supported protection of species such as the Galápagos giant tortoise. The case demonstrates the importance of regulating tourism in ecologically fragile environments (Benitez-Capistros et al., 2016).

3. Kenya

In Kenya, ecotourism has been associated with wildlife conservation and community participation. Tourism-related income can support anti-poaching measures, protected-area management and local livelihood opportunities, creating incentives for communities to participate in conservation (Makindi, 2016).

Technology and Future Directions

Future ecotourism conservation strategies can increasingly use GIS and remote sensing to monitor habitat change, tourism infrastructure and environmental degradation. These technologies provide spatial information that can

assist managers in identifying sensitive areas and assessing changes over time (Table 2). Community-based conservation will also remain important because local participation can connect livelihood benefits with long-term protection of natural resources.

Table 2: Ecotourism and overtourism: Contrasting environmental outcomes		
Aspect	Ecotourism	Overtourism
Main purpose	Conservation-oriented travel.	High-volume tourism.
Tourist volume	Controlled/ managed.	Excessive.
Environmental impact	Seeks to minimize impacts.	Can cause habitat degradation and pollution.
Resource use	Sustainable management encouraged.	Greater pressure on water and other resources.
Infrastructure	Eco-friendly and planned.	Can exceed local capacity.
Conservation	Supports conservation activities.	Can undermine conservation.
Examples	Costa Rica, Galápagos.	Venice, Bali.

Conclusion

Ecotourism can serve as an important mechanism for biodiversity conservation by generating conservation finance, supporting habitat and wildlife protection, promoting environmental education and contributing to ecosystem restoration. However, its benefits are not automatic. Tourism-related pollution, infrastructure development, resource consumption, carbon emissions and excessive visitor numbers can undermine ecological objectives. Effective visitor management, scientific monitoring, community participation and reinvestment of tourism revenue into conservation are therefore essential. When these elements are integrated, ecotourism can contribute to biodiversity protection, ecosystem restoration and ecological resilience while providing a sustainable basis for conserving natural landscapes.

References

Baloch, Q.B., Shah, S.N., Iqbal, N., Sheeraz, M., Asadullah, M., Mahar, S., Khan, A.U., 2023. Impact of tourism development upon environmental sustainability: A suggested framework for sustainable ecotourism. *Environmental Science and Pollution Research* 30(3), 5917-5930. DOI: <https://doi.org/10.1007/s11356-022-22496-w>

Benitez-Capistros, F., Hüge, J., Dahdouh-Guebas, F., Koedam, N., 2016. Exploring conservation discourses in the Galapagos Islands: A case study of the Galapagos

giant tortoises. *Ambio* 45, 706-724. DOI: <https://doi.org/10.1007/s13280-016-0774-9>

Broadbent, E.N., Zambrano, A.M.A., Dirzo, R., Durham, W.H., Driscoll, L., Gallagher, P., Salters, R., Schultz, J., Colmenares, A., Randolph, S.G., 2012. The effect of land use change and ecotourism on biodiversity: A case study of Manuel Antonio, Costa Rica, from 1985 to 2008. *Landscape Ecology* 27, 731-744. DOI: <https://doi.org/10.1007/s10980-012-9722-7>

Goodwin, H., 1996. In pursuit of ecotourism. *Biodiversity & Conservation* 5(3), 277-291. DOI: <https://doi.org/10.1007/BF00051774>

Gossling, S., Hansson, C.B., Hörstmeier, O., Saggel, S., 2002. Ecological footprint analysis as a tool to assess tourism sustainability. *Ecological Economics* 43(2-3), 199-211. DOI: [https://doi.org/10.1016/S0921-8009\(02\)00211-2](https://doi.org/10.1016/S0921-8009(02)00211-2)

Huynh, D.V., Duong, L.H., Duong, K.Q., Nguyen, T.T., 2025. Examining interpretation services and pro-nature conservation behaviours in guided ecotours: Do tour guides and tourists share the same lens? *Journal of Ecotourism* 24(2), 114-135. DOI: <https://doi.org/10.1080/14724049.2024.2366933>

Makindi, S.M., 2016. Local communities, biodiversity conservation and ecotourism: A case study of the Kimana Community Wildlife Sanctuary, Kenya. *African Journal of Hospitality, Tourism and Leisure* 5(3), 1-15.