DEVELOPING ECOTOURISM ROUTES IN MOUNTAIN REGIONS OF UZBEKISTAN: A CASE STUDY OF ZOMIN DISTRICT

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Annotatsiya: Ekoturizm barqaror turizmning muhim yo‘nalishlaridan biri bo‘lib, atrof-muhitni muhofaza qilish, madaniy merosni saqlash hamda mahalliy aholining ijtimoiy-iqtisodiy rivojlanishini qo‘llab-quvvatlashga xizmat qiladi. O‘zbekiston tog‘ hududlari, o‘rmon resurslari, qo‘riqlanadigan tabiiy hududlari va boy biologik xilma-xilligi tufayli ekoturizmni rivojlantirish uchun katta salohiyatga ega. Ushbu tadqiqot O‘zbekistonning tog‘ hududlarida ekoturizm marshrutlarini rivojlantirish imkoniyatlari va muammolarini Zomin tumani misolida tahlil qiladi.

Kalit so‘zlar: ekoturizm, tog‘ turizmi, barqaror turizm, Zomin tumani, ekoturizm marshrutlari, mahalliy hamjamiyat.

Аннотация. Экотуризм является одним из важных направлений устойчивого туризма, поскольку он объединяет охрану окружающей среды, сохранение культурного наследия и социально-экономическое развитие местного населения. Горные регионы Узбекистана обладают значительным потенциалом для развития экотуризма благодаря природным ландшафтам, лесным ресурсам, охраняемым территориям и богатому биоразнообразию. В данной статье рассматриваются возможности и проблемы развития экотуристических маршрутов в горных регионах Узбекистана на примере Зааминского района.

Ключевые слова: экотуризм, горный туризм, устойчивый туризм, Зааминский район, экотуристические маршруты, местное сообщество.

Abstract. Ecotourism is one of the most important forms of sustainable tourism, as it combines environmental conservation, cultural preservation and socio-economic benefits for local communities. Uzbekistan has significant potential for ecotourism development due to its diverse mountain landscapes, protected natural areas, forest resources, rich biodiversity and cultural traditions. This study examines the opportunities and challenges of developing ecotourism routes in the mountain regions of Uzbekistan, with a particular focus on Zomin District.

Keywords: ecotourism, mountain tourism, sustainable tourism, Zomin District, ecotourism routes, local community participation.

1. Introduction

Tourism is widely recognized as one of the key sectors contributing to economic growth, employment generation, cultural exchange and regional development. In recent decades, increasing environmental concerns and the growing demand for responsible travel have strengthened the importance of sustainable tourism practices. Within this context, ecotourism has become one of the most relevant forms of tourism, as it aims to minimize negative environmental impacts while supporting local communities and promoting environmental awareness among visitors.

Ecotourism is generally understood as responsible travel to natural areas that conserves the environment, improves the well-being of local people and provides educational experiences for tourists. Unlike mass tourism, ecotourism emphasizes environmental protection, small-scale tourism development, local community participation and respect for natural and cultural heritage. Therefore, it is especially

relevant for mountain regions, where natural landscapes, biodiversity and traditional lifestyles represent important tourism resources.

Uzbekistan possesses considerable potential for ecotourism development. The country has diverse mountain ranges, forests, protected areas, rural settlements and unique natural landscapes that can serve as a basis for sustainable nature-based tourism. Among these areas, Zomin District occupies a special place due to its favorable climate, mountain scenery, forest resources and ecological importance. Zomin National Nature Park is one of the most valuable natural areas in the country and represents an important destination for ecological, recreational and educational tourism.

Despite this potential, ecotourism development in Zomin District remains below its possible level. Insufficient infrastructure, limited transportation accessibility, weak destination promotion, shortage of qualified tourism specialists and environmental management problems continue to limit the sustainable development of tourism in the region. In addition, existing tourism activities are not always organized according to clear route-based planning principles, which may reduce visitor satisfaction and increase environmental pressure on natural areas.

Therefore, this study aims to analyze the opportunities and challenges of developing ecotourism routes in Zomin District and to propose a sustainable route-development model for mountain regions of Uzbekistan. The study focuses on tourist demand, natural resource potential, infrastructure needs, environmental protection and local community participation.

The main objectives of the study are:

1. to assess tourist interest in mountain tourism and ecotourism activities;
2. to identify the main barriers to ecotourism development in Zomin District;
3. to develop a route-oriented model for sustainable ecotourism planning;
4. to propose practical ecotourism routes based on tourist preferences, natural resources and sustainability principles.
5.
6. LITERATURE REVIEW

Ecotourism has received increasing attention in tourism research as a sustainable form of tourism that combines nature conservation, community development and visitor education. Honey (2008) defines ecotourism as responsible travel to natural areas that conserves the environment and improves the well-being of local people. Fennell (2020) also emphasizes that ecotourism should contribute to biodiversity conservation while generating economic benefits for host communities.

Mountain regions are particularly important for ecotourism development because they offer unique landscapes, biological diversity, recreational opportunities and traditional cultural environments. Hall and Boyd (2005) argue that mountain tourism can contribute to regional economic development when it is properly planned and managed. However, uncontrolled tourism growth may also create environmental pressures, including waste generation, habitat disturbance and degradation of natural resources.

Previous studies show that successful ecotourism development depends on several key factors: effective route planning, environmental management, local community involvement, visitor education, infrastructure quality and cooperation between stakeholders. Newsome, Moore and Dowling (2012) emphasize that natural area tourism requires a balance between visitor satisfaction and conservation objectives. This is especially important in mountain destinations, where fragile ecosystems can be negatively affected by unregulated tourist flows.

In the context of Central Asia, ecotourism is increasingly viewed as a promising direction for economic diversification and rural development. International and national tourism studies indicate that Uzbekistan's mountain regions have considerable potential for nature-based tourism, but this potential has not yet been fully transformed into competitive tourism products. Existing studies have mainly focused on the general tourism potential of natural areas, while less attention has been given to practical route planning, visitor preferences and the integration of local communities into ecotourism products.

Several researchers have examined ecotourism opportunities in Uzbekistan. Shukurboeva and Safarovich (2024) studied ecotourism cluster development around the Sangzor–Jizzakh reservoir and concluded that integrated planning can strengthen regional competitiveness. Karimova (2025) analyzed the ecotourism potential of the Bukhara region and highlighted the importance of infrastructure

development and destination marketing. Berdimurodov (2024) specifically examined the tourism resources of Zomin District and identified its mountain landscapes, biodiversity and favorable climatic conditions as important factors for tourism development.

However, there remains a research gap in the field of route-based ecotourism planning for Zomin District. Most previous works have focused on the general description of tourism potential, while fewer studies have proposed practical route models based on tourist demand, environmental sustainability and community participation. This research addresses this gap by proposing a route-oriented approach to ecotourism development in Zomin District.

Scientific Novelty

The scientific novelty of this research lies in the development of a route-oriented model for sustainable ecotourism planning in mountain regions of Uzbekistan, using Zomin District as a case study. Unlike previous studies that mainly focused on the general assessment of tourism potential, this study integrates tourist demand analysis, natural resource assessment, environmental management principles and local community participation into a single route-development framework.

The novelty of the study is expressed in three main aspects. First, the research identifies the relationship between tourist preferences and the design of ecotourism routes in Zomin District. Second, it proposes a practical model for ecotourism route development based on the sequence of tourist demand assessment, resource evaluation, route design, infrastructure support, environmental management and community participation. Third, the study develops three differentiated ecotourism routes: an educational eco-trail, a mountain trekking route and a community-based ecotourism route. These routes are designed to support sustainable tourism development, reduce uncontrolled visitor pressure on natural areas and increase the socio-economic involvement of local communities.

1. METHODS

This study employed a descriptive survey-based research design supported by secondary data analysis. The research was conducted to assess tourist preferences, perceived barriers and practical opportunities for developing ecotourism routes in Zomin District.

Primary data were collected through a structured questionnaire prepared in Google Forms. The questionnaire was distributed among tourism students, local residents, domestic travelers and individuals interested in mountain and nature-based tourism. A total of 40 respondents participated in the survey.

The questionnaire included closed-ended questions aimed at measuring respondents' previous experience of visiting mountain destinations, awareness of ecotourism, preferred tourism activities and perceived barriers to ecotourism development. Open-ended questions were also included to collect additional opinions regarding infrastructure, environmental protection, service improvement and local community involvement.

Secondary data were obtained from academic literature, government reports, tourism-related publications and studies on ecotourism, sustainable tourism and mountain tourism development. These sources were used to support the theoretical framework and compare the empirical findings with previous research.

Quantitative data were analyzed using descriptive statistics, mainly frequencies and percentages. The percentages were calculated according to the total number of respondents. Qualitative responses were examined through thematic interpretation in order to identify recurring issues related to infrastructure, transportation, environmental protection, destination promotion and community participation.

The methodological logic of the study consisted of four stages:

1. analysis of tourist demand;
2. identification of key barriers to ecotourism development;
3. assessment of natural and socio-cultural resources of Zomin District;
4. development of sustainable ecotourism route proposals.

This methodological approach allowed the study to connect empirical survey results with practical route planning recommendations.

1. RESULTS

The survey results demonstrate considerable interest in mountain tourism and ecotourism activities among respondents. Out of 40 respondents, 33 participants, or 82.5%, stated that they had visited mountain destinations in Uzbekistan at least once. This indicates that mountain areas already have a relatively high level of recognition among domestic tourists and can serve as a strong basis for further ecotourism development.

In addition, 30 respondents, or 75%, reported that they were familiar with the concept of ecotourism. This finding suggests that ecological awareness among potential visitors is increasing, which creates favorable conditions for promoting responsible travel behavior, environmental education and sustainable tourism products.

The most preferred tourism activities were relaxation and recreation, selected by 16 respondents, or 40%; hiking and trekking, selected by 10 respondents, or 25%; photography, selected by 8 respondents, or 20%; and wildlife and nature observation, selected by 6 respondents, or 15%.

These findings show that tourists are interested not only in passive recreation but also in active and educational forms of nature-based tourism. Therefore, ecotourism route planning in Zomin District should include different types of tourism experiences for different visitor groups.

The survey also revealed several barriers limiting the development of ecotourism in mountain regions. High travel costs were identified by 17 respondents, or 42.5%, as the main barrier. Infrastructure deficiencies were mentioned by 11 respondents, or 27.5%. Environmental pollution concerns were reported by 7 respondents, or 17.5%, while transportation difficulties were indicated by 5 respondents, or 12.5%.

These results demonstrate that the development of ecotourism routes in Zomin District should not be limited only to the creation of tourist trails. It should also include improvements in accessibility, accommodation, tourist information services, environmental protection measures, guide training and destination marketing.

Proposed Ecotourism Routes for Zomin District

Based on survey findings, resource analysis and sustainable tourism principles, three ecotourism routes were proposed for Zomin District.

Route 1: Zomin National Park Eco-Trail

The Zomin National Park Eco-Trail is designed as a short educational and recreational route within the natural landscape of Zomin National Nature Park. The route may include forest areas, biodiversity observation points, mountain viewpoints and environmental information boards. The estimated duration of the route is one day.

This route is suitable for families, students, school groups and tourists interested in nature education. The main activities include guided nature walks, bird watching, biodiversity observation, photography and environmental interpretation. To ensure sustainability, the route should include marked trails, waste collection points, information boards, trained guides and clear visitor behavior rules.

Route 2: Mountain Trekking Route

The Mountain Trekking Route is designed for physically active tourists, adventure travelers and hikers. The route may include mountain paths, forest landscapes, camping areas and panoramic viewpoints. The estimated duration of the route is two to three days.

The main activities include trekking, camping, nature photography and observation of mountain landscapes. Since trekking routes may create environmental pressure, this route requires clear trail marking, safety signs, trained guides, emergency communication and regulation of camping zones. Environmental protection measures should include restrictions on uncontrolled camping, waste management and fire safety rules.

Route 3: Community-Based Ecotourism Route

The Community-Based Ecotourism Route focuses on the involvement of local residents in tourism services. This route connects villages surrounding Zomin District and includes family guesthouses, traditional cuisine, handicraft workshops, local guiding and cultural interpretation. The estimated duration of the route is one to two days.

This route is suitable for responsible tourists interested in local traditions, rural lifestyles and cultural heritage. Its main advantage is that it allows tourism income to remain within the local

community. At the same time, it promotes the preservation of traditional knowledge, crafts and hospitality culture.

Table 1. Proposed Ecotourism Routes for Zomin District

Route	Main focus	Duration	Target visitors	Key activities	Required infrastructure	Sustainability measures
Zomin National Park Eco-Trail	Environmental education and nature observation	1 day	Families, students, nature tourists	Guided walks, bird watching, biodiversity observation, environmental interpretation	Marked trails, information boards, resting points, waste bins, guide service	Visitor code of conduct, waste control, limited group size, environmental education
Mountain Trekking Route	Active mountain tourism	2–3 days	Adventure tourists, hikers, young travelers	Trekking, camping, photography, panoramic viewpoint visits	Trail marking, safety signs, camping zones, emergency communication, trained guides	Carrying-capacity control, fire safety rules, prohibition of uncontrolled camping
Community-Based Ecotourism Route	Local culture and community participation	1–2 days	Cultural tourists, responsible travelers	Guesthouse stay, traditional cuisine, handicraft workshops, village walks	Family guesthouses, local guide service, craft demonstration areas, sanitary facilities	Direct income for local residents, preservation of traditions, support for small businesses

1. DISCUSSION

The findings confirm that Zomin District has strong potential for sustainable ecotourism development due to its natural landscapes, recreational resources and growing tourist interest in mountain areas. The high percentage of respondents who had previously visited mountain destinations indicates that mountain tourism is already an attractive form of domestic tourism in Uzbekistan.

At the same time, the results show that tourist interest alone is not sufficient for sustainable development. High travel costs, infrastructure deficiencies, environmental concerns and transportation difficulties directly affect destination accessibility and visitor satisfaction. These barriers are consistent with the broader literature on mountain and nature-based tourism, where infrastructure, environmental management and local stakeholder coordination are considered key factors for sustainable tourism development.

The proposed routes address different segments of tourist demand. The Zomin National Park Eco-Trail responds to the need for short, accessible and educational nature-based experiences. The Mountain Trekking Route responds to the demand for active and adventure tourism. The Community-Based Ecotourism Route reflects the principles of responsible tourism by involving local residents in accommodation, guiding, food services and handicraft activities.

From a sustainability perspective, the most important issue is to prevent uncontrolled tourism growth. Increased visitor flow without proper management may lead to waste accumulation, damage to vegetation, disturbance of wildlife and degradation of natural landscapes. Therefore, each route should include environmental management tools such as marked trails, waste control, visitor information boards, guide supervision and limits on group size where necessary.

Community participation is also a central condition for long-term sustainability. If local residents receive direct economic benefits from tourism, they are more likely to support environmental conservation and maintain cultural traditions. Therefore, the development of guesthouses, local guide services, craft workshops and traditional food services should be considered an essential part of the ecotourism route system.

Based on the results, the following route-development model is proposed:

Tourist Demand Assessment → Natural Resource Assessment → Route Design → Infrastructure and Service Development → Environmental Management → Local Community Participation → Sustainable Ecotourism Development

This model shows that ecotourism route development should begin with the analysis of tourist demand and territorial resources. Route design should then be adapted to environmental capacity, visitor interests and local community opportunities. Infrastructure and services improve accessibility and tourist satisfaction, while environmental management protects natural ecosystems. Community participation ensures that tourism contributes to local income, cultural preservation and regional economic development.

1. Conclusion

This study examined the opportunities and challenges of developing ecotourism routes in the mountain regions of Uzbekistan, using Zomin District as a case study. The results demonstrate that Zomin has considerable potential for ecotourism development due to its natural landscapes, biodiversity, recreational resources and increasing tourist interest in mountain destinations.

The survey results showed that 82.5% of respondents had previously visited mountain destinations in Uzbekistan, while 75% were familiar with the concept of ecotourism. The most preferred activities were relaxation and recreation, hiking and trekking, photography, and wildlife observation. These findings indicate that Zomin District can develop diversified ecotourism products for different visitor groups.

However, the study also identified several barriers to sustainable ecotourism development. High travel costs, infrastructure deficiencies, environmental pollution concerns and transportation difficulties remain the main obstacles. These problems reduce accessibility, weaken tourist satisfaction and may limit the competitiveness of the destination.

The main contribution of the study is the development of a route-oriented model for sustainable ecotourism planning and the proposal of three practical ecotourism routes: the Zomin National Park Eco-Trail, the Mountain Trekking Route and the Community-Based Ecotourism Route. These routes are designed to combine tourist demand, environmental protection and local community participation.

The implementation of the proposed routes can contribute to regional economic development, employment creation, environmental conservation and the diversification of Uzbekistan's tourism products. For effective implementation, it is recommended to improve road and tourism infrastructure, introduce environmental management measures, train local guides, support family guesthouses, develop destination marketing and ensure cooperation between government institutions, tourism businesses, environmental organizations and local communities.

Practical Recommendations

Based on the findings of the study, the following recommendations are proposed:

1. To develop clearly marked and environmentally regulated ecotourism trails in Zomin National Nature Park and surrounding mountain areas.
2. To improve basic tourism infrastructure, including road access, sanitary facilities, tourist information boards, resting areas, waste collection points and emergency communication systems.
3. To introduce environmental management measures such as visitor codes of conduct, waste control, group-size regulation and environmental education for tourists.

4. To involve local residents in tourism services through family guesthouses, local guiding, traditional cuisine, handicraft workshops and cultural interpretation programs.
5. To create digital promotion tools for Zomin ecotourism routes, including online maps, QR-coded route information, social media campaigns and multilingual tourist information materials.
6. To organize training programs for local guides and service providers on ecotourism principles, visitor safety, first aid, foreign language communication and sustainable hospitality.
7. To establish cooperation between local authorities, tourism enterprises, educational institutions and environmental organizations for the coordinated management of ecotourism routes.

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