RESEARCH ARTICLE

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Environmental effects of tourism activities in Niksar Çamiçi Plateau in the context of sustainable tourism: a qualitative research

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Abstract

Tourism, as a booming industry, plays a significant role in shaping economies and cultural exchanges worldwide. However, the rapid growth of tourism has brought about both positive economic impacts and negative environmental consequences. This research delves into the environmental effects of tourism activities through the lens of sustainable tourism. Focusing on Niksar Çamiçi Plateau, a transition zone between Central Anatolia and the Black Sea Region, situated at an altitude of 1350 meters, the study aims to identify the specific environmental impacts resulting from tourism activities in this unique location. The research adopts participant observation and semi-structured interviews as data collection methods, enabling a comprehensive understanding of tourists' and locals' behaviors and practices concerning the environment. The findings highlight the pressing issues of unplanned development, urban sprawl, migration, and environmental pollution in regions experiencing concentrated tourism activities. In response to these challenges, the study proposes a set of sustainable tourism solutions to mitigate environmental degradation. Recommendations include promoting responsible tourism practices, reducing the carbon footprint, promoting environmentally friendly accommodation and transportation, and implementing effective waste management strategies. Additionally, raising awareness among tourists and local communities about the importance of preserving natural resources and cultural heritage emerges as a crucial approach. This study contributes to the growing body of knowledge on sustainable tourism by providing valuable insights into the complex relationship between tourism and the environment, particularly in Niksar Çamiçi Plateau. By advocating for sustainable practices, the research aims to strike a balance between economic growth and environmental conservation, ensuring a harmonious coexistence between tourism and the ecosystem.

Keywords: Sustainable Tourism, Environmental Impacts, Niksar Çamiçi Plateau, Responsible Tourism, Environmental Conservation

INTRODUCTION

Tourism is defined as a significant economic sector on a global scale (Gössling, et al., 2023; Scott et al., 2012; Hardy, et al., 2002). The advancement of transportation and communication technologies has contributed to the growth of the tourism industry, leading to a noticeable increase in the number of people traveling for tourism purposes worldwide (UNWTO, 2020). The relationship between tourism and the environment is a dynamic interplay where the impacts of tourism activities on natural and cultural surroundings, as well as efforts to minimise negative effects and promote responsible practices, shape the overall

ecological and social sustainability of destinations (Hall, 2021). Recognising the significant role of tourism in the global economy and understanding its evolving relationship with the environment underscores the need for a concerted effort towards sustainable practices that preserve both the allure of destinations and the integrity of our planet for future generations.

However, the rapid expansion of the tourism sector has also increased its environmental impacts (Zhong et al., 2011). Mass tourism and unplanned growth can give rise to environmental issues (Razali et al., 2018). Especially in areas where tourism activities are concentrated, negative effects such as unplanned urbanization, migration, environmental pollution, and the assimilation of cultural values are more commonly experienced (Türker, 2020).

This study focuses on the environmental effects of tourism activities and takes Niksar Çamiçi Plateau as an example. Situated on the transition route from the Central Anatolia Region to the Black Sea Region, Niksar Çamiçi Plateau is a tourist destination known for its natural riches and pine forests (TİKTM, 2021). The study aims to identify the environmental impacts of tourism activities in the plateau settlement and evaluate them from the perspective of sustainable tourism.

Tourism is a complex socio-economic phenomenon that interacts with cultural and natural environments (Briassoulis & Straaten, 2000). Tourism mobility can affect the natural environment, socio-cultural structure, and economy of the visited regions (Mejjad et al., 2022; Rezaei et al., 2020; Karakaya et al., 2013). The environmental impacts of tourism can manifest in various dimensions in areas with concentrated tourism activities. These impacts can lead to concerns about environmental sustainability, such as environmental pollution, ecosystem disturbances, depletion of natural resources, and a decrease in plant and animal species (Sharpley & Telfer, 2014).

Sustainable tourism is an approach that aims to manage tourism activities in a balanced manner, considering economic, socio-cultural, and environmental aspects (Yfantidou & Matarazzo 2017; Gündüz, 2016; Liu, 2003). Sustainable tourism focuses

on meeting the needs of local communities and preserving the natural environment to increase positive impacts of tourism and minimize negative ones (Koçoğlu et al., 2020; Swarbrooke & Horner, 2007). Touristic activities cause an increase in carbon footprints worldwide. Sustainable management of touristic activities and reduction of carbon footprints are critical in terms of minimising environmental impacts on a global scale and protecting the natural resources of future generations (Çelik, 2022). Adopting an effective waste management strategy in the tourism industry is an important step towards protecting the environment without harming natural beauty, maintaining the quality of life of local communities, and ensuring the long-term sustainability of tourist destinations (Obersteiner Eet al., 2021). Informational signage plays a critical role in raising environmental awareness in tourist areas, as it provides visitors with an opportunity to understand local ecosystems, natural resources, and sensitive areas and guides them in minimising environmental impacts (Cole, 2011).

The primary objective of this study is to investigate the environmental impacts of tourism activities on the Niksar Çamiçi Plateau from a sustainability perspective. Understanding the effects of tourism on the plateau's environment is critical for implementing measures for environmental conservation and formulating policies for sustainable tourism (Wang et al., 2017). To accomplish this aim, a comprehensive analysis of the environmental impacts of tourism in the plateau area will be conducted using participant observation and semi-structured interviews.

Previous research on sustainable tourism has predominantly emphasised its benefits, such as economic growth, employment generation, and cultural exchange (Agrawal et al., 2022; Atak, 2016; Gündüz, 2022; Loureiro & Nascimento, 2021; Aktaş & Çiçek, 2019; Gkoumas, 2019; Atasoy et al., 2018; Ağca, 2016; Demircan, 2016; Carter et al., 2015; Hardy et al., 2002). However, there is a growing body of literature underscoring the necessity of striking a balance between tourism development and environmental conservation. Studies have highlighted cases where unregulated tourism has resulted in deforestation, pollution, habitat destruction, and disruption of local ecosystems (Mejjad et al., 2022; Wang et al., 2021; Barletta et al., 2010; Davenport & Davenport, 2006). To address these concerns, researchers and policymakers have advocated for the adoption of sustainable practises aimed at minimising negative impacts while maximising the benefits of tourism (Özgit & Öztüren, 2021; Vernon et al., 2005).

The environmental impacts of tourism, together with factors such as heavy visitor flow, infrastructure needs, and waste generation, can lead to degradation of natural areas, increased water and energy consumption, and loss of biodiversity. The management of these impacts and the adoption of sustainable tourism practices are vital to ensuring that natural and cultural resources are protected for future generations (Mikayilovet al, 2019). This study is crucial for comprehending the environmental impacts of tourism activities in regions endowed with natural and cultural wealth, such as the Niksar Çamiçi Plateau. By revealing how the rapid expansion of the tourism sector affects environmental resources and societal structures, it will offer policy recommendations for managing tourism in harmony with principles of sustainability. Furthermore, this research will promote the development of sustainable tourism practises by encouraging the engagement of environmentally

conscious tourists and local communities. The findings from the Niksar Çamiçi Plateau will serve as a model for addressing environmental impacts in similar tourism destinations.

In conclusion, this study represents a significant stride towards understanding and managing the environmental ramifications of tourism activities on the Niksar Çamiçi Plateau. Assessing the environmental impacts of tourism based on scientific evidence is vital to ensuring the preservation of natural resources for future generations (Shasha et al., 2020). Additionally, the research will contribute to advocating for eco-friendly practises within the tourism sector by providing policy recommendations for the eco-conscious management of tourism activities.

MATERIALS AND METHODS

The Study Area

The research was conducted in Niksar Çamiçi Plateau, located in the transition area from the Central Anatolian Region to the Black Sea Region, at an approximate altitude of 1350 meters (TİKTM, 2021). The plateau is situated approximately 16 kilometers away from Niksar district center and can be reached by car within approximately 25 minutes. The plateau experiences the highest population density during the summer months when tourism activities are at their peak (Gündüz & Topaloğlu, 2019).

Sampling Techniques and Sample Size

This study employed a qualitative research design. Data were collected using participant observation and semi-structured interviews. In qualitative research, the researcher is a key instrument for data collection (Kılıç et al., 2020). The researcher gains the opportunity to gather information on-site by obtaining permission from and joining the group being observed (Uzuner, 1999).

A purposive sampling method, specifically criterion sampling, was employed to determine the study group. Criterion sampling involves selecting individuals, events, objects, or situations with specific characteristics related to the problem being studied (Büyüköztürk et al., 2009; Yıldırım & Şimşek, 2004). The study group of 14 individuals, comprising local residents and business owners, who were directly involved with tourism activities in the plateau. Within the scope of the research, 3 visits were made to the plateau region in July, August and September 2021. During these visits, a group of fourteen residents and tradesmen in the highland talked about the environmental impacts of tourism by Gökçe et al. (2015) were asked questions prepared by making use of the study.

Methods of Data Analysis

The data analysis process involved thematic analysis, which is a common approach in qualitative research. Thematic analysis allows the researcher to identify, analyze, and report patterns or themes within the data (Braun & Clarke, 2006). The transcribed interviews and observation notes were carefully reviewed, and key themes related to the environmental impact of tourism were identified.

The identified themes were then organized into a table to provide a comprehensive overview of the environmental effects. The table included the specific environmental impacts (e.g., noise pollution, air pollution, water pollution, etc.) as rows, and three columns labeled "exists", "partially", and "does not exist" to indicate the presence and intensity of each impact. Additionally, the table presented the months in which these effects were most pronounced to identify seasonal patterns.

The analysis also involved identifying prominent issues through direct observation. The researcher observed areas such as the campsite, health center, gendarmerie post, and restaurant zone, and documented the environmental pollution problems using photographs and notes.

Ethical Considerations

The study adhered to ethical principles by obtaining informed consent from the participants and ensuring their anonymity. Ethical approval for this study was received from the Tokat Gaziosmanpaşa University Social and Humanity Sciences Research Ethics Committee, numbered 12/03 and dated 09.19.2022. The study was carried out in accordance with the ethical rules and standards determined by the research institution.

Limitations

It is important to acknowledge certain limitations of this research. The sample size was relatively small due to the low population and limited tradesmen in the highlands, and it represented a specific group of people in a specific geographic area. Therefore, the findings may not be fully generalizable to other locations or communities. In addition, the research focused only on the environmental impacts of tourism in the Niksar Çamiçi Plateau and did not address other aspects of sustainability or its economic impacts. In conclusion, this study used qualitative research methods to investigate the environmental impact of tourism on the Niksar Çamiçi Plateau. The thematic analysis was used to identify key environmental issues related to tourism activities. The findings offer valuable insights into the challenges faced by the plateau and offer recommendations for sustainable tourism development. However, it would be beneficial to work with larger and more diverse sample groups in order to comprehensively cover the broad aspects of sustainability in the tourism sector.

RESULTS AND DISCUSSION

The fundamental objective of this study is to comprehensively examine the ecological repercussions

stemming from tourism activities within the confines of the Niksar Çamiçi Plateau, within the overarching framework of sustainable tourism practises. Utilising a quantitative methodology, the investigation delves into the variations in population density on the plateau across different months. This population density computation is underpinned by data gathered through comprehensive interviews with local residents and merchants. Each participant was requested to assess the relative population density of the plateau on a scale of one hundred points. The resultant Figure 1 is a composite representation of the average scores derived from these assessments.

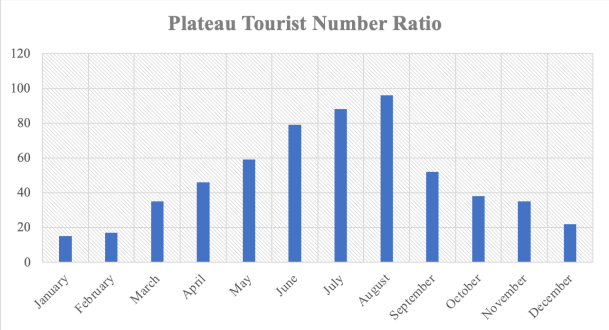

Figure 1. Plateau Tourist Number Density by Month

Analysing the population density trends depicted in Figure 1 serves as a pivotal conduit for deciphering the cyclic fluctuations in environmental impacts. The initial months of January and February exhibit a palpable reduction in plateau inhabitants, signifying a discernible decrease in both local residents and tourists, a pattern attributed to the prevailing winter conditions. Conversely, the onset of March signals a noticeable resurgence in population density, which correlates with the advent of spring. April and May are characterised by a more pronounced escalation in population density, distinctly underscoring the heightened allure of the plateau to tourists as the natural environment undergoes rejuvenation.

The zenith of tourist density materialises during the months of June and July. As the summer vacation season unfolds, the plateau transforms into a preferred destination for vacationers and explorers. This juncture imposes elevated pressures on the plateau's ecological system, thereby accentuating the necessity for structured environmental oversight. August similarly witnesses a substantial population density, reaffirming the plateau's enduring appeal as summer approaches its zenith.

The month of September witnesses a gradual decrease in the tourist influx, coinciding with the conclusion of the summer holiday period. During this phase, the number of visitors, including both local residents and merchants, displays a discernible decline. The subsequent months of October and November experience a further attenuation in population density as the winter season approaches, accompanied by a concomitant decrease in interest in the plateau. December marks the nadir of occupancy, mirroring the seasonal retreat during the wintertime.

These findings furnish invaluable insights into the seasonal dynamics of tourism activities at the Niksar Çamiçi Plateau and their associated environmental consequences. Adherence to the principles of sustainable tourism is of paramount importance in safeguarding the plateau's ecosystem integrity and counteracting the encroachment of environmental degradation. The implications of this study hold relevance for the domain of tourism management and strategic planning, offering an elemental blueprint for the forthcoming tourism progression of the Niksar Çamiçi Plateau.

The results gleaned from the interview, which included participants from the Niksar Çamiçi region, provide noteworthy insights into the prevalence and intricate interplay of diverse environmental pollutants. The ensuing analysis corroborates the observations delineated in Table 1:

Noise Pollution and Air Pollution: The data indicate that 43% of the participants reported experiencing noise pollution, and 50% identified air pollution as a concern in the region. Both noise and air pollution show their highest presence during June and July, with June being one of the busy months for both pollutants. This similarity in peak periods suggests a possible correlation between noise and air pollution, which can be attributed to the increased vehicular activities and tourist influx during the plateau season and weekends. For example, Participant-4 mentioned experiencing noise annoyance due to vehicle sounds near the Ünye highway on some days, which likely contributes to air pollution through vehicle emissions. Moreover, Participant-13 highlighted that noise levels increase during the plateau season, indicating a possible relationship between increased tourist activities and elevated air pollution during this period.

Air Pollution and Water Pollution: The data show that 50% of the participants reported air pollution as a concern, while 29% identified water pollution. When the Air Quality News Bulletins prepared by the Ministry of Environment, Urbanisation, and Climate Change (2022) are examined, the particulate matter pollutant (PM10) values between Çamiçi Plateau and Ünye also confirm this pollution. For example, while the value measured by Kardemir Karabük Station, which is an iron and steel industrial zone, is 39, the value measured by Ünye and Tokat stations has reached 48. This shows that the air pollution rate is higher than the industrial situation in the region.

Interestingly, both air and water pollution demonstrate similar busy months, with the plateau season being a critical period for both pollutants. Participants-6 and -14

Table 1. Regional Pollution Impact Analysis and Participant Feedback

Effects	Present (Number of Participants)	Partially Present (Number of Participants)	Absent (Number of Participants)	Busy Months	Example Responses
Noise Pollution	n=6 (43%)	n=5 (36%)	n=3 (21%)	June-July	Participant-4: "We experience noise annoyance due to vehicle sounds near the Ünye highway on some days." Participant-2: "The noise increases near the gendarmerie station at times and can affect the quality of sleep." Participant-13: "Noise levels increase during the plateau season and can be disturbing on weekends."
Air Pollution	n=7 (50%)	n=4 (29%)	n=3 (21%)	Plateau season (Weekends)	Participant-6: "Air pollution from the nearby highway affects the plateau air." Participant-14: "Air pollution, possibly caused by tourists coming to the area during weekends (barbecues), increases." Participant-3:"During the plateau season, weekend traffic increases, leading to a decline in air quality."
Water Pollution	n=4 (29%)	n=3 (21%)	n=7 (50%)	May-June	Participant-9: "We see some signs of pollution in the water resources during the months of May and June (when the plateau becomes touristically crowded). Participant-1: "In some areas, water sources get polluted due to environmental contamination." Participant-5: "With the start of the plateau season, the water quality of some streams decreases."
Soil Pollution	n=10 (71%)	n=4 (29%)	n=0 (0%)	May-June-July-August	Participant-7: "In May and June, soil pollution becomes more apparent, and we can see litter around." Participant-8: "We don't experience any issues with soil pollution; our lands are clean and productive." Participant-4:"Agricultural pesticides and chemicals can affect our soil; we need to be careful."

mentioned that air pollution from the nearby highway and recreational activities during weekends and the plateau season contribute to air pollution in the region. Given that the route from the Central Anatolian region to the Middle Black Sea region traverses through this plateau, the occurrence of elevated air pollution is posited, primarily during the summer season, attributable to vehicular congestion and halts. This observation suggests a potential connection between increased tourism-related activities and higher air pollution levels, which may subsequently impact water quality. For instance, pollutants emitted into the air can deposit into

water bodies through wet and dry deposition, leading to contamination. Or it is possible for the garbage left from the vehicles to pollute the water resources by the wind. Participant-5's response also supports this finding, stating that the water quality of some streams decreases with the start of the plateau season.

Water Pollution and Soil Pollution: The data indicate that 29% of the participants reported water pollution, and a concerning 71% identified soil pollution in the region. In Image 1, there is a visual of the soil pollution detected by the researcher in Çamiçi Plateau. This pollution can also affect water resources from time to time, as stated by the participants.

Both water and soil pollution exhibit their highest presence during May and June. Intensification of agricultural activities can also be among the causes of water pollution. However, in this study, only questions about pollution originating from tourism were asked to the participants. Participants-9 and -1 reported observing signs of water pollution during these months, while Participant-7 mentioned that soil pollution becomes more apparent in May and June, with visible litter observed in the area. This close alignment in peak periods suggests a possible link between water and soil pollution, particularly during the busy months. Agricultural runoff and improper waste disposal may contribute to both water and soil contamination during this period. For example, Participant-4 highlighted the potential impact of agricultural pesticides and chemicals on soil pollution, supporting the idea of a relationship between agricultural activities and soil contamination, which can, in turn, affect water quality.

Image 1. Environmental Pollution Observed by the Researcher in Niksar Çamiçi Plateau

Air Pollution and Soil Pollution: The data show that 50% of the participants reported air pollution, while 71% identified soil pollution. Although no direct correlation is evident in the data between air and soil pollution, it is essential to consider the potential indirect effects of air pollution on soil quality. Airborne pollutants, such as particulate matter and gaseous pollutants, can deposit onto the soil surface, leading to soil contamination over time. While the data do not explicitly reveal a relationship, it is plausible that the presence of air pollution may have implications for soil health. Further research is needed to explore this potential connection more comprehensively.

The findings from the interview support the interrelationships between different environmental pollutions in the Niksar Çamiçi region. The numerical data in the table align with the observed patterns, indicating potential correlations between noise pollution and air pollution, air pollution and water pollution, and water pollution and soil pollution. Soil and water pollutions mentioned in this study have been evaluated from a touristic point of view, not from an agricultural point of view. Pollutions seen in Image 1 originate from tourism and have a negative impact on soil and water. These findings underscore the importance of taking an integrated and holistic approach to environmental management to effectively address the interconnected environmental challenges in the region. Implementing targeted pollution control measures and seasonal management strategies can contribute to a sustainable and healthy environment for the residents of Ünye.

The data presented in Table 2 provide insight into the effects of various factors on flora, fauna, construction, infrastructure and informative signage in the Niksar Çamiçi Plateau region. Figure 2 shows an example of human damage to trees in the plateau region. Findings on the subject are discussed below:

Image 2. An example of the damage done by the picnickers to the trees in the Çamiçi Plateau

Alterations in Flora: A significant proportion, approximately 64.3%, of the surveyed participants conveyed the occurrence of perturbations in the indigenous flora, notably accentuated during the bustling months of July and August. Participant-3 made specific note of observing pronounced disruptions in the botanical realm during the summer months, resulting in a decline in certain plant species. Image 2 below shows the damage done to the trees by the tourists who come to the plateau for a picnic. Similarly, Participant-2 documented compromised flora within camping vicinities, characterised by indications of desiccation and diminished botanical diversity. In contrast, Participant-4

Table 2. Regional Deterioration Impact Analysis and Participant Feedback

Impact Type	Present (Participant Count)/ Percentage Present	Partially Present (Participant Count)/ Percentage Partially Present	Absent (Participant Count)/ Percentage Absent	Busy Months	Example Responses
Disturbance in Flora	n=9 (64.3%)	n=3 (21.4%)	n=2 (14.3%)	July-August	Participant-3: "During the summer months, we observe serious disturbances in the flora, and some plant species have decreased." Participant-2: "In some camping areas, the flora has been damaged, and we noticed withered plants and reduced plant diversity." Participant-4: "We generally didn't detect any disturbances in the flora, and we observed the preservation of natural beauty."
Disturbance in Fauna	n=5 (35.7%)	n=3 (21.4%)	n=6 (42.9%)	Plateau season	Participant-9: "During the plateau season, we haven't noticed a significant disturbance in wildlife, and animals are generally present." Participant-6: "We observe partial disturbances in animal presence, and some animals' behaviors have changed." Participant-8: "We haven't observed any negative impact on animal presence during the plateau season, and the richness of natural life continues."
Excessive and Unplanned Construction	n=13 (92.9%)	n=1 (7.1%)	n=0 (0.0%)	All months except winter	Participant-10: "In some areas, we believe construction is unplanned, which is visually disturbing." Participant-11: "We observed only one example of construction at the plateau, and we didn't detect excessive construction." Participant-9: "We think there is excessive construction at the plateau, and it disrupts the natural balance."
Insufficiencies in Infrastructure	n=11 (84.6%)	n=2 (15.4%)	n=0 (0.0%)	Plateau season	Participant-14: "We occasionally come across infrastructure insufficiencies, but mostly there are adequate infrastructure services." Participant-1: "During the plateau season, we didn't detect any infrastructure insufficiencies, and infrastructure services are generally in good condition." Participant-3: "During the plateau season, we face infrastructure insufficiencies, and there are interruptions in water and electricity supply."
Insufficiencies in Informative Signboards	n=5 (35.7%)	n=7 (50.0%)	n=2 (14.3%)	June-July-August	Participant-7: "During June, July, and August, we feel the lack of informative signboards for visitors." Participant-8: "Most of the time, informative signboards are insufficient, and they lack essential information for tourists." Participant-11: "We have enough informative signboards, and visitors usually have no trouble finding their way."

documented an absence of discernible floral disturbances and attested to the persistence of the area's innate natural allure. The observed disturbances within the floral ecosystem during the zenith of tourist activity can be attributed to escalated anthropogenic engagements, such as camping and recreational excursions, which can culminate in trampling, littering, and the infringement of natural habitats. To alleviate these impacts and uphold the region's biodiversity, the implementation of sustainable tourism protocols and the institution of initiatives for habitat preservation stand as imperatives.

Disturbances in Fauna: Roughly 35.7% of the respondents conveyed the existence of disturbances within the fauna domain during the plateau season. Participant-9 remarked upon the paucity of discernible faunal perturbations during this interval, while Participant-6 alluded to partial perturbations in animal presence coupled with shifts in behavioral patterns. Conversely, Participant-8 noted an absence of deleterious effects on animal presence and underscored the profusion of natural vitality during the plateau season. The identified faunal disturbances during this period may be correlated with heightened human presence, resultant clamour, and the concomitant interactions between humans and wildlife. To safeguard indigenous wildlife, the imperative lies in the adaptation of conscientious tourism practises, the preservation of unobstructed pathways for wildlife mobility, and the abstention from any encroachments upon their habitats.

Unbridled and Unplanned Urbanisation: A substantial majority, accounting for 92.9% of the participants, underscored the pervasiveness of uncontrolled and haphazard urban development across the region, a phenomenon recurring throughout the year excepting the winter months. Participant-10 and Participant-9 both chronicled the encroachment of rampant construction activities, with Participant-10 lamenting the visual blight consequent to unregulated construction undertakings. Yet, Participant-11 cited a solitary illustration of construction, implying the absence of universally conspicuous, unbridled development. The ubiquity of unchecked and unplanned construction endeavours can culminate in the degradation of habitats, aesthetic pollution, and a transformed physical milieu. The countering of this predicament necessitates the enforcement of stringent zoning mandates, the institution of environmental impact assessments, and the advocacy of sustainable developmental paradigms.

Insufficiencies in Infrastructure: Around 84.6% of the participants reported insufficiencies in infrastructure during the plateau season. Participant-14 and Participant-1 mentioned that infrastructure services were generally adequate during this period. However, Participant-3 highlighted infrastructure insufficiencies, including interruptions in water and electricity supply. The presence of insufficiencies in infrastructure can impact the quality of tourism experiences and local residents' well-being. To enhance the region's infrastructure and ensure a positive visitor experience, investment in essential services such as water, electricity, waste management, and transportation is crucial.

Insufficiencies in Informative Signboards: Approximately 35.7% of the participants reported the presence of insufficiencies in informative signboards, with 50% partially present during the busy months of June, July, and August. Participant-7 and Participant-8 mentioned the lack of informative signboards during these months, while Participant-11 stated that they have enough informative signboards. Insufficient informative signboards can lead to navigation difficulties for visitors and negatively impact their overall experience. To enhance visitor satisfaction and ensure safety, adequate and well-placed informative signboards with essential information should be provided in key locations. In addition, it is important for highway authorities to put up warning signs in order to increase environmental awareness and prevent littering on the roadsides.

The findings from the survey highlight the diverse impacts of various factors on the flora, fauna, construction, infrastructure, and informative signboards in the Ünye region. These impacts are closely related to tourism activities and human interactions with the environment. Sustainable tourism practices, environmental protection measures, and improved infrastructure services are vital to ensure the long-term preservation of the region's natural beauty, biodiversity, and overall ecological integrity. Collaborative efforts between local authorities, stakeholders, and the community are essential to address these impacts and promote responsible and sustainable tourism practices in the Niksar Çamiçi Plateau region.

CONCLUSION

Consequently, this qualitative research delved into the environmental ramifications of tourism activities within the Niksar Çamiçi Plateau, employing the lens of sustainable tourism. The investigation illuminated the intricate interplay between tourism development and its ecological repercussions. The findings underscored the multifaceted challenges stemming from haphazard expansion, urban sprawl, population migration, and environmental pollution in regions concentrated in tourism activities. This issue aligns with the findings of Özdemir & Tabak (2019) and Deniz (2019), whose studies also yielded analogous results. These challenges, particularly the interconnected predicaments of noise, air, water, and soil pollution, manifest prominently during peak tourism months and the plateau season. Gökçe et al. (2015) similarly contended that such issues are more pronounced during periods of high plateau visitation. The tourism sector is a sector that can harm the environment and increase its carbon footprint due to its structure (Lenzen et al., 2018). No study has been

found on reducing the carbon footprint.

The research underscores the imperative of embracing sustainable tourism practises to mitigate environmental degradation within the Niksar Çamiçi Plateau and analogous tourist destinations. An array of recommendations has been offered to overcome the identified difficulties. Chief among them is the advocacy for responsible tourism practises that inculcate conscientious behaviour among tourists, fostering the safeguarding of natural environs and cultural heritage. This sentiment is echoed by Oğuz & Yılmaz (2019), who, in their research, affirmed that environmental awareness significantly influences responsible tourism practises. Furthermore, endorsing ecologically friendly lodging and transportation alternatives such as eco-lodges and electric vehicles stands as an effective measure for curtailing the carbon footprint generated by tourism activities.

Interview participants underscored that the sites within the plateau compromise water resources and soil integrity. Consequently, the implementation of effective waste management strategies that prioritise recycling and proper waste disposal is pivotal in curtailing pollution and conserving the plateau's pristine allure. Oliver et al. (2021) also contend that attitudinal variables exert influence over recycling behaviours, substantiating earlier findings that vacationers display a diminished inclination to recycle. Thus, initiatives aimed at enhancing tourist awareness upon visiting the plateau become of paramount importance. Equally crucial is the role of awareness campaigns targeted at both tourists and local communities, accentuating the significance of preserving natural assets and cultural heritage. These endeavours can engender a sense of environmental stewardship and sustainable tourism values, involving all pertinent stakeholders.

Likewise, enhancing infrastructure and augmenting informative signage emerge as indispensable for elevating the overall tourist experience and mitigating the adverse consequences of inadequate infrastructure. Environmental information signs are important tools that help the community and visitors understand environmental impacts and increase environmental awareness. These signs are used in natural areas, historical sites, parks, and other public places. It provides information to visitors on issues such as the value of the environment, sensitive ecosystems, local flora and fauna, and sustainable tourism practices, and contributes to making informed decisions and exhibiting environmentally friendly behaviors (Rezaei et al., 2023; De Sausmarez, 2007). Participants emphasised that these information signs are insufficient during the summer months. It is recommended that these deficiencies be corrected by local governments.

A subset of research participants emphasised that water shortages during the summer months adversely impact both tourists and plateau inhabitants. Strategic investments in water supply, electricity, and other essential amenities will undoubtedly contribute to a more sustainable tourism milieu. This sentiment aligns with the findings of Adeola & Evans (2020) in their exploration of Africa, affirming the constructive role of robust infrastructure in advancing tourism.

It is important to consider the suggestions to ensure the development of sustainable tourism in Niksar Çamiçi Plateau by ensuring the balance between tourism and the environment. These recommendations aim to strike a harmonious balance between economic growth and environmental protection. Tourism and environmental factors engage in a complex interaction where the dynamics of traveller behaviour, local ecosystems, and resource use intricately shape the sustainability of destinations (Kallmuenzer et al., 2019). The research provides a broader perspective on the principles of sustainable tourism by considering the complex interaction of tourism and environmental factors from an insightful perspective. The unique ecosystem and cultural heritage of Niksar Çamiçi Plateau are preserved for future generations, offering an exemplary model for local governments, policymakers, and other stakeholders. While Corazza (2020) emphasised that the sustainability training to be given to managers is of critical importance, Yüksek et al. (2019) provide an important perspective on how tourism stakeholders' awareness of sustainable tourism contributes to overall sustainability efforts. In this context, the aim of the study is to encourage a more in-depth cooperation between tourism development and the sensitive ecosystem, so that a balanced approach is adopted, considering both economic progress and environmental protection.

Understanding the limitations of the study and the encountered problems is crucial, as it necessitates careful consideration when making generalisations; for instance, the effects of focusing on a specific time frame or sample size should be evaluated. In this context, some recommendations for future researchers can be made: Exploring similar environmental and sustainable tourism issues in different regions can contribute to understanding both overall trends and regional variations. A more detailed examination of tourist behaviours can deepen our comprehension of influencing factors and offer insights for designing effective awareness campaigns. Sustainability heavily relies on the active involvement and conscientious actions of local communities, as they play a pivotal role in preserving the ecological balance and cultural heritage of their regions (Bergquist, 2007). The role of local community engagement holds critical importance in understanding factors influencing the success of sustainable tourism. Investigating the impacts of significant environmental challenges, especially climate change, on sustainable tourism can be vital for shaping future approaches. Analysing the strategies

of local governments and policymakers can aid in understanding effective planning and implementation, thereby contributing more effectively to the realisation of sustainable tourism.

COMPLIANCE WITH ETHICAL STANDARDS

This research adhered to ethical principles and guidelines while conducting the study. Informed consent was obtained from all participants, and their voluntary participation in interviews and observations was ensured. The study also maintained the anonymity and confidentiality of the participants' information. Ethical approval was obtained from the relevant institutional review board for the study.

Peer-review

Externally peer-reviewed.

Conflict of interest

The author declare no conflict of interest regarding this research. The study was conducted in an impartial manner and there were no external influences or financial interests that could affect the research results.

Author Contribution

Authors designed the study, collected data through participant observation and semi-structured interviews, conducted data analysis and wrote the first draft of the article.

Ethics committee approval

Ethical approval for this study was received from the Tokat Gaziosmanpaşa University Social and Humanity Sciences Research Ethics Committee, numbered 12/03 and dated 09.19.2022. The study was carried out in accordance with the ethical rules and standards determined by the research institution.

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Data availability

The data and materials used in this study are provided for academic and research purposes upon request from the relevant author, subject to ethical considerations and the consent of the participants.

Release

All participants gave written consent for publication of the study's findings. The use of direct citations and descriptive information in this article was approved by the participants.

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