

Opportunities and Challenges of Ecotourism in Dhanushadham Protected Forest of Madhesh Province, Nepal

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Abstract: This study assesses the opportunities and challenges for ecotourism in Dhanushadham Protected Forest of Nepal using a mixed-methods approach involving direct observations, household surveys, key informant interviews, and focus group discussions. Local perceptions of ecotourism are explored and the key factors influencing its development are identified. The findings reveal the Dhanushadham's significant ecotourism potential due to its rich biodiversity, cultural and religious sites and opportunities for activities like jungle walks, birdwatching and camping. Establishment of mini zoo, Maithili museum, homestays and cultural programs can add more opportunities for the development of ecotourism in the area. While local communities largely support ecotourism and recognize its conservation benefits, key challenges include political instability, inadequate tourism infrastructure, limited promotion, and the absence of a visitor information center. The study concludes that realizing Dhanushadham's ecotourism potential necessitates addressing these challenges through targeted interventions such as awareness campaigns, infrastructure development, and improved governance along with strategies to increase the length of stay for visitors. This study contributes to the limited body of knowledge on ecotourism in protected forests, particularly within the Madhesh Province of Nepal, offering valuable insights for policymakers and stakeholders seeking to develop sustainable tourism strategies in similar contexts.

Key words: *Protected Forest, Ecotourism, Homestays, Biodiversity, Culture*

1. Introduction

Tourism, the movement of people to countries or places outside their usual environment, contributes to local economies, job creation, and long-term development (Beza, 2017; Sukhdev et al., 2010). Fueled by global economic growth and rising tourism demand, the number of international travelers increased by 4% in 2019, reaching 1.5 billion (UN Tourism, 2020). Tourism holds the potential to boost investment, employment, exports, and technology in less developed countries and small island developing states while minimizing negative environmental impacts (UNEP, 2020).

Ecotourism was defined by The International Ecotourism Society (1991), as "a responsible travel to natural areas that conserves the environment and improves the well-being of local

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people." This form of tourism is distinct from other types due to its foundational principles, as articulated by (Hetzter, 1965). These principles emphasize minimizing environmental impacts, respecting host cultures, maximizing local benefits, and enhancing tourist satisfaction. It also fosters learning and appreciation of the natural environment, or specific aspects thereof, within the local cultural context. As one of the fastest-growing segments of the tourism industry, ecotourism ensures the sustainable use of natural resources while simultaneously providing economic opportunities for local communities (Chowdhury et al., 2011; Farrell and Runyan, 1991; Nguyen, 2022).

Although primarily a form of nature-based tourism, ecotourism is closely linked to adventure tourism and cultural tourism, both of which are offered by a diverse array of tourism operators (Cater and Cater, 2015; Lee et al., 2023; Poyyamoli, 2018). Furthermore, ecotourism serves as a pathway for sustainable tourism, addressing the needs of current tourists and host regions while safeguarding and enhancing opportunities for the future (Poyyamoli 2018).

Ecotourism offers significant potential for developing countries like Nepal, providing employment opportunities for the unskilled workforce and attracting entrepreneurs and organizations to rural and remote protected areas, thanks to their unique natural environments (Nepal, 1997; UNEP, 2013). Community-based rural ecotourism focuses on providing opportunities for both domestic and international visitors while simultaneously supporting the livelihoods of local communities (Acharya and Halpenny, 2013). Recognizing the value of ecotourism, the Nepalese government has actively promoted national parks, buffer zones, wildlife reserves, conservation areas, and cultural sites to protect biodiversity and boost tourism (Baral et al., 2019). Ecotourism presents a promising avenue for generating income from natural resources sustainably, without harming the environment or disrupting local traditions, while contributing to the economic well-being of communities and stakeholders (Cusack and Lawhon, 2006). The Nepalese government has previously recognized ecotourism as a vital sector that contributes significantly to job creation, income generation, environmental conservation, and socioeconomic development (Acharya and Halpenny, 2013).

Ecotourism has demonstrably contributed to environmental, economic, and social development in various regions of Nepal. Examples include increased income and improved livelihoods alongside biodiversity conservation in Ghandruk (K.C. et al., 2015) and the Manaslu Conservation Area (K.C. & Thapa Parajuli, 2015). Ecotourism has also created employment opportunities for indigenous Tharu communities near Chitwan National Park, while preserving their local culture (Lipton and Bhattarai, 2014). Ecotourism is an ideal strategy for achieving both economic and ecological success, promoting biodiversity conservation, livelihood improvement, and community development.

Nepal possesses immense potential in the ecotourism industry. However, a lack of commitment to integrated conservation and development in government policy and planning strategies has hindered the promising development of ecotourism activities. The COVID-19 pandemic has further exacerbated this situation, creating uncertainty and a lasting impact on the sector. While much research focuses on the impact of ecotourism on livelihoods in various parts of Nepal, there is a dearth of studies specifically examining the opportunities and challenges of ecotourism in protected forests. Dhanushadham Protected Forest, with its rich natural, cultural, and religious diversity, holds significant potential as an ecotourism destination.

This study aims to understand the potential opportunities and challenges for ecotourism development in Dhanushadham Protected Forest in Madhesh Province of Nepal. The specific objectives are to 1) identify and evaluate ecotourism opportunities in Dhanushadham Protected

Forest; 2) analyze local community perceptions of ecotourism development; and 3) assess key challenges hindering ecotourism development. It is hypothesized that local community support for ecotourism is positively correlated with perceived economic and non-economic benefits from ecotourism activities. The study contributes to both academic understanding of ecotourism development in protected forest contexts and offers practical insights for policymakers and local stakeholders to design sustainable tourism strategies that balance conservation, community benefit, and economic growth in similar regions.

2. Study area

The study was conducted in Dhanushadham Protected Forest of Madhesh Province which falls under Dhanushadham Municipality of Dhanusha district in Nepal (Figure 1). The forest lies 20km North-East to Janakpur, the capital of Madhesh Province. Government of Nepal announced this forest as Protected Forest on 25th February 2014 due to its biological and historical importance. The total area of the forest is 360 hectares and main tourist attractions of the forest are Blue Bull Antelope and different species of trees, birds, mammals, turtles and snakes ([Mithila Wildlife Trust, 2016](#)).

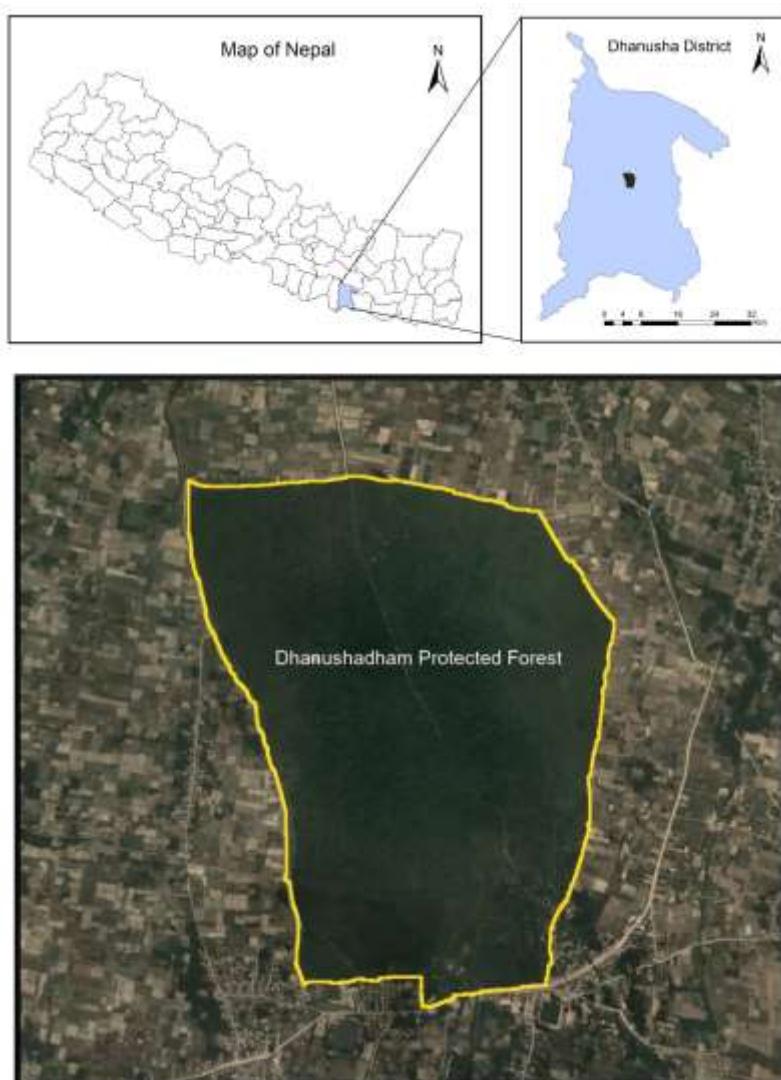


Figure 1. Location map of Dhanushadham Protected Forest.

As per Nepal Census 2011, the study area comprises 8603 households. The forest is attached to Dhanush Temple where a piece of Pinak Dhanush (Lord Shiva's Bow) has fallen, which carries religious significance in Hinduism. Dhanushadham Protected Forest consists 18 hectares of wetland habitat, including the source of the Ban Ganga River. Thousands of Hindu pilgrims and other tourists visit this place every year. Mithila Wildlife Trust, Department of Forest and Dhanushadham Protected Forest Council have been working actively for conservation of the forest since its announcement as Protected Forest. Mithila Wildlife Trust has prepared a concept to develop the forest as a Biological Unit which has been approved by Department of Forests, Ministry of Forests and Soil Conservation, Government of Nepal.

3. Data collection and analysis

The study primarily explores associative and correlated relationships between variables such as perceptions of local people and ecotourism outcomes using mixed methods research design. Preliminary visit was carried out in February 2022 to observe the feasibility of the study area and for rapport building with the community and local government. Direct observation of the potential ecotourism sites was done by field visit in Dhanushadham Protected Forest and nearby area. Out of 8603 households, 86 households (1%) were selected for questionnaire survey. The households were randomly selected and semi-structured questionnaire was used for the household survey to get the information from the local people about status and their perception of ecotourism. Key informant interview was conducted with officials from Ministry of, Industry, Tourism and Forest, Janakpurdham and Divisional Forest Office, Dhanusha; representatives from Dhanushadham Protected Forest and Mithila Wildlife Trust to discuss the opportunities and challenges of ecotourism and to gather overall information related to ecotourism management activities. Focus group discussion was conducted with members of protected forest, Mushar women's group and local stakeholders to determine the problems and potential opportunities for the development of ecotourism. The relevant data and information were also collected from various books, research articles, journals and reports from concerned authorities.

The collected data were analyzed by using MS Excel. Perception of local people was assessed by using 3-point Likert Scale (1= Agree, 2= Neutral and 3= Disagree). Weighted mean was calculated by using following formula:

$$\text{Weighted mean} = \sum (w_i \cdot x_i) / \sum w_i$$

Where, w_i = Respondents response in %, and x_i = Value assigned to agreement. The findings were interpreted in the suitable form such as chart, bar-graph, table etc.

4. Results

4.1.Socio-demographic information of the respondents

The respondents exhibited diverse demographic and socioeconomic characteristics (Table 1). Out of the 86 respondents, 62% were male, and 38% were female. Age wise, 36% of the respondents were of age group 41-50, 29% were of age group 21-30, 20% were of 50 above age and 15% were of age group 31-40. In terms of ethnicity, the largest representation was from the other group (37%), followed by Yadav (29%), Dalit (22%), and Mushar (12%). Agriculture was the primary occupation for the 40% of the respondents, while others were engaged in business (26%), services (14%), and various other activities (20%). The educational attainment of the respondents was relatively good, with 23% having completed primary level education (grades 1-5), 43% having completed high school level education (grades 5-12) and 12% of the respondents went to college.

Table 1. Socio-demographic characteristics of respondents

S.N.	Respondent Characteristics	Category	Frequency	Percentage
1	Gender	Female	33	38
		Male	53	62
2	Age	21-30	25	29
		31-40	13	15
		41-50	31	36
		Above 50	17	20
3	Ethnicity	Yadav	25	29
		Dalit	19	22
		Mushar	10	12
		Other	32	37
4	Main occupation	Agriculture	34	40
		Business	22	26
		Services	12	14
		Others	18	20
5	Education	Illiterate	19	22
		Primary	20	23
		High school	37	43
		College	10	12

4.2. Current status of ecotourism

The survey of 86 respondents revealed a mixed perception of ecotourism in Dhanushadham Protected Forest. While 45% considered the status of ecotourism to be "good," 33% found it "satisfactory." However, 22% of respondents felt that the status of ecotourism was "poor" and required improvement.

4.3. Tourist flow

Prior to the COVID-19 pandemic, Dhanushadham Protected Forest attracted a significant number of visitors, with an estimated 30,000 to 40,000 tourists visiting annually (Mithila Wildlife Trust, 2016). The pandemic significantly impacted tourism in the area, but visitor numbers are gradually recovering. According to the respondents, the forest experiences a surge in visitors during religious festivals such as Ram Navami, Bibaha Panchami, Makar Mela, and Mithila Parikrama. Over 50% of tourists visiting Dhanushadham Protected Forest are international, with a majority being Indian tourists seeking religious and cultural experiences. In recent times, there has been a noticeable increase in the number of domestic tourists as well.

4.4. Existing features and attractions of ecotourism in Dhanushadham Protected Forest

4.4.1 Temples and Lakes

Dhanushadham Protected Forest is an important religious site deeply intertwined with Hindu and Mithila culture. The forest is home to the Dhanush Temple, where a piece of Pinak Dhanush (Lord Shiva's Bow) is said to have fallen, holding immense religious significance for Hindus. The forest also encompasses the Dhanushadham Reservoir, a vital water source. Thousands of Hindu pilgrims and tourists visit the area annually, particularly during religious festivals like Ram Navami, Bibaha Panchami, Makar Mela, and Mithila Parikrama. According to legend, the Ban

Ganga River, which originates within the forest's 18 hectares of wetland habitat, was created during the Treta Yug by Lord Ram to alleviate water scarcity in the Dhanushadham region. The forest boasts seven lakes, with Parshuram Lake and Rani Pokhari being popular tourist attractions. Boating facilities are available on the lakes for recreational activities.

4.4.2 Jungle walk

Dhanushadham Protected Forest is rich in floral and faunal biodiversity reported 40 species of trees including *Shorea robusta*, *Dalbergia sissoo*, *Bombax ceiba*, *Maesa macrophilla*, *Artocarpus integrifolia*, *Schleichera oleosa*, *Terminalia bellirica*, *Acacia catechu* in Dhanushadham Protected Forest. People come all the way from Patna, India to watch the *Shorea robusta* (Sal) forest. Animals like *Boselaphus tragocamelus* (Blue bull antelope), *Macaca mulatta* (Rhesus Macaque), *Sus scrofa* (Wild boar) and different species of birds, snakes and turtles are found in the forest. Many tourists come here to enjoy the scenic beauty of the forest, and watch birds and animals. There are some foot trail routes where the visitors can walk and enjoy the beautiful scenery of forests.

4.4.3 Bird watching

Birdwatching, a popular recreational activity and form of wildlife observation, thrives in Dhanushadham Protected Forest. Home to over 251 bird species, including the Lesser Adjutant (*Leptoptilos javanicus*), Asian Openbill (*Anastomus oscitans*), Lesser Whistling-duck (*Dendrocygna javanica*), Red-naped Ibis (*Pseudibis papillosa*), Rufous Treepie (*Dendrocitta vagabunda*), Great Cormorant (*Phalacrocorax carbo*), Crimson Sunbird (*Aethopyga siparaja*), and many more (Mithila Wildlife Trust, 2016), the forest offers a diverse avian spectacle. It also attracts numerous migratory birds traveling vast distances in search of resources. Dhanushadham Protected Forest has become a renowned birdwatching destination for both visitors and researchers.

4.4.4 Camping

Camping is a recreational activity where individuals spend at least one night outdoors, differentiating it from day trips or picnics. It can be enjoyed in natural areas and is possible in all seasons. Dhanushadham Protected Forest offers decent camping spots for the visitors.

4.4.5 Research center

Dhanushadham Protected Forest provides an exceptional environment for students and researchers to study flora and fauna. While the forest offers a wealth of knowledge, there remains significant potential for further exploration and research in this area.

4.5.Respondents' views on the existing opportunities of ecotourism

Respondents were asked about the existing features which attract tourists the most in the study area and were asked to rank accordingly, 1 being the most attracting feature. The local people ranked temples and lakes as most attracting feature in the study area, followed by jungle walk, bird watching, research center and camping respectively (Table 2).

Table 2. Ranking on existing opportunities

Features and attractions	Rank
Temples and Lakes	1
Jungle walk	2
Bird watching	3
Research centre	4
Camping	5

4.6. Additional Opportunities of Ecotourism in Dhanushadham Protected Forest

4.6.1 Establishment of Maithili Museum

A cultural museum showcasing the region's rich heritage, social values, and traditions holds immense potential to attract tourists. The people of the Dhanushadham Protected Forest area are eager to establish such a museum, and the creation of a Maithili Museum could be a significant boost to tourism in the region. Tourists are often captivated by unique cultures and traditions, and a Maithili Museum would offer a fascinating glimpse into this vibrant heritage.

4.6.2 Homestays

Homestays provide travelers with an authentic local experience, combining basic necessities like food and shelter with the opportunity to interact with local families. The lack of accommodation facilities in the area currently limits tourist visits to just a few hours, forcing them to return to Janakpur city for overnight stays. Homestays offer a solution, allowing tourists to spend more time exploring Dhanushadham Protected Forest while simultaneously providing local residents with a source of income and a platform to promote their culture.

4.6.3 Cultural Programs

The residents of the Dhanushadham Protected Forest area are predominantly from the Maithili culture, which is known for its distinctive and unique traditions, making it a major draw for tourists. Cultural dances like Jhijhiya, Jharijhari, Jhatjhati, and Jhakri, along with traditional Mithila cuisine such as Kachari, Jhili, Bagiya, Thekuwa, and Ghonghi, hold immense potential to attract visitors. Properly managed cultural shows and dance performances could captivate tourists, encouraging them to stay longer and experience the region's rich heritage.

4.6.4 Establishment of Mini Zoo

Dhanushadham Protected Forest is home to a diverse array of mammals, birds, turtles, and snakes, providing exciting wildlife viewing opportunities for tourists. The establishment of a mini zoo, as outlined in the concept developed by the Mithila Wildlife Trust and approved by the Department of Forests, Ministry of Forests and Soil Conservation, Government of Nepal, could significantly enhance the forest's appeal as an ecotourism destination. This initiative would allow visitors to observe and learn about the region's fascinating wildlife in a controlled and educational environment.

4.7. Respondents' perception on the additional opportunities of ecotourism

When asked about additional ecotourism opportunities, 41% of the respondents favored the establishment of a mini zoo, believing it would significantly benefit ecotourism in Dhanushadham Protected Area. Homestays were preferred by 24% of the respondents, while 20% supported the creation of a Maithili museum and the remaining (15%) favored the organization of cultural programs.

4.8. Problems hindering ecotourism development in Dhanushadham Protected Forest

Despite its beauty and potential, Dhanushadham Protected Forest faces several challenges that hinder its development as an ecotourism destination. These challenges were identified through direct site observations, key informant interviews, and focus group discussions.

4.8.1. Political issues

Political stability is crucial for the sustainable development of any area, and Dhanushadham is no exception. A lack of strong commitment from local leaders towards sustainable development is

a significant obstacle. The municipality has shown limited interest in promoting ecotourism, and budget allocation for the development and management of Dhanushadham Protected Forest remains inadequate. Furthermore, confusion exists between the federal and provincial governments regarding budget allocation for the forest. These issues, coupled with security concerns at tourism sites, create a challenging environment for ecotourism development.

4.8.2. Lack of infrastructures and proper management

The management of Dhanush Temple, one of the area's key attractions, is a major concern. A lack of public toilets, parking facilities for buses, and proper road infrastructure (most roads are not blacktopped) creates a less-than-ideal experience for visitors. The absence of homestays for food and accommodation further hinders the potential for longer stays. While a Dharmashala previously served as a lodging option, it is now being used as a municipality building. Pollution and inadequate solid waste management near tourist spots also negatively impact the overall tourism experience.

4.8.3 Insufficient advertisement and promotion

A notable challenge for Dhanushadham Protected Forest is the lack of awareness and information among potential tourists. Many visitors to Janakpur are unaware of the forest's existence, resulting in limited exploration. Insufficient promotion is a major contributing factor to this lack of awareness. To attract more tourists, effective promotion and advertising campaigns are crucial, leveraging the reach of ecotourism organizations and travel agencies.

4.8.4 Lack of visitor information center

A visitor information center is essential for any tourist destination, providing crucial information about services, attractions, and features. Unfortunately, Dhanushadham lacks such a center, leaving tourists without a central source of information. The absence of a well-defined system to communicate information about recreational activities within the forest further hinders the tourist experience.

4.8.5 Lack of awareness

A lack of awareness among local residents about ecotourism is a significant barrier to its development in Dhanushadham Protected Forest. Many locals are not fully aware of their own rich cultural heritage and the natural resources that could attract tourists. Furthermore, a lack of understanding about ecotourism and its potential for economic and social benefits hinders the community's engagement in this sector.

4.9. Respondents' views on the problems

When asked to rank the most significant obstacles to ecotourism development in Dhanushadham Protected Forest, with 1 being the most hindering, local residents identified political issues as the primary challenge. Insufficient advertisement and promotion, lack of infrastructure and proper management, lack of awareness, and the absence of a visitor information center followed behind (Table 3).

Table 3. Respondents' ranking of the problems

Problems	Rank
Political issues	1
Insufficient advertisement and promotion	2
Lack of infrastructures and proper management	3
Lack of awareness	4
No visitor information center	5

4.10. Perception of respondents towards ecotourism

To explore respondents' perceptions of ecotourism, a 3-point Likert scale was used, with ratings ranging from 1 (Agree) to 3 (Disagree). Respondents were asked to express their level of agreement with statements regarding various aspects of ecotourism. The analysis of the data obtained using the Likert scale is presented in the table below.

Table 4. Perception of respondents towards ecotourism

Statement	Description	Response in percentage (%)			Weighted mean Results	Remarks
		1	2	3		
1.	Dhanushadham Protected Forest is suitable for ecotourism.	81	14	5	1.24	Agreed
2.	Ecotourism helps to conserve the environment.	47	34	19	1.72	Neutral
3.	Ecotourism improves livelihood of people.	78	16	6	1.28	Agreed
4.	There is no negative impact of ecotourism like drug, alcoholism, culture imitation, etc.	37	46	17	1.8	Neutral
5.	Income from ecotourism will be used in community development.	73	18	9	1.36	Agreed
6.	The poor and disadvantaged group should be encouraged and involved in ecotourism	84	9	7	1.23	Agreed
7.	There is sound social and political condition in Dhanushadham Protected Forest.	6	32	62	2.56	Disagreed
8.	Development of homestays	17	0	83	2.66	Disagreed
9.	Good transportation and communication facilities are currently available	9	12	79	2.70	Disagreed
10.	Opportunities to promote local and cottage industry exists	84	16	0	1.16	Agreed
11.	See tourists in Dhanushadham Protected Forest	76	16	8	1.32	Agreed
12.	Aware about conservation of forest resource	86	14	0	1.14	Agreed
13.	Hidden natural, cultural and religious features of the area will be exposed	74	13	13	1.39	Agreed

Thirteen statements were presented to respondents, who were asked to express their agreement or disagreement using a Likert scale. Based on the weighted mean, respondents generally agreed with most of the statements. However, they disagreed with statements 7, 8, and 9, while expressing neutrality towards statements 2 and 4 (Table 4). The majority of respondents agreed that Dhanushadham Protected Forest holds immense potential for ecotourism development and that they are aware of the importance of conserving forest resources. They also expressed agreement with the statements that ecotourism should encourage and involve the poor and disadvantaged, promote local and cottage industries, and improve the living standards of local people.

5. Discussion

The study found that cultural and religious aspects are key attractions of Dhanushadham Protected Forest, aligning with findings by (Yang, 2019) in Yiren Town, China. Cultural tourism often respects natural environments (Atun et al., 2019), and souvenirs taken by tourists can be seen as cultural identity markers (Elomba and Yun, 2018). The forest's natural beauty is another significant draw, echoing studies by (Montaguti and Mingotto, 2015) and (Schirpke et al., 2020) in Italy. The combination of cultural and natural attractions is a common theme in successful

ecotourism destinations, as evidenced by research in Cuba (Salinas et al., 2018), China (Dong et al., 2015; Zhao and Jia, 2008), and Nepal (Acharya and Halpenny, 2013; K.C. et al., 2021, 2015). Dhanushadham's biodiversity, including over 251 bird species and various mammals, turtles, and snakes (Mithila Wildlife Trust, 2016), further enhances its appeal. The forest's diverse flora, including 40 tree species (K.C. and Deshar, 2018), contributes to its ecotourism potential (Aryal and Maharjan, 2018; Bahmanpour et al., 2012).

While Dhanushadham has basic infrastructure like roads, drinking water, and electricity, inadequate sanitation and sewage management negatively impact the tourist experience. This aligns with findings by (Fuuml et al., 2012), which suggest that dilapidated basic facilities can limit tourist appeal. To fully realize its ecotourism potential, Dhanushadham needs to address these infrastructure gaps. Community-based ecotourism has been shown to enhance the welfare and well-being of marginalized communities by generating employment opportunities (Bennett and Roe, 2014). This aligns with the findings of the present study, where almost all respondents believed ecotourism would increase income, create jobs, and boost local businesses. Previous research has documented the positive impact of ecotourism on local incomes (K.C. et al., 2015; Nyaupane and Thapa, 2004). While the majority of respondents in the present study acknowledged Dhanushadham Protected Forest's potential for ecotourism, many were unfamiliar with concepts like homestays, cultural programs, museums, and the social and political context of the area. This lack of knowledge is likely due to limited education among some residents, as (Okello, 2004) found that educated individuals had greater knowledge and support for ecotourism.

The study identified the establishment of a mini zoo, a Maithili museum, homestays, and cultural programs as potential opportunities for ecotourism in Dhanushadham Protected Forest, echoing findings by (Chettri, 2015) in Kakrebihar Protected Forest. Locally-run homestays hold promise for promoting ecotourism and creating alternative livelihoods for residents. Local representatives and provincial government officials cited a lack of coordination in budget allocation as a major obstacle to Dhanushadham's development, a concern raised by many respondents.

This study confirms a positive correlation between perceived benefits of ecotourism and local community support. Respondents overwhelmingly agreed that ecotourism improves livelihoods (78%), generates income for community development (73%), and promotes local industries (84%) (Table 4). This aligns with findings from studies in Nepal demonstrating positive community perceptions of ecotourism's economic and non-economic benefits, particularly in destinations such as Manaslu Conservation Area (K C & Thapa Parajuli, 2015) and Jagadishpur wetland (Aryal et al., 2022). Globally, research consistently shows that community support for ecotourism strengthens when benefits such as, income generation and employment, are evident (Mohanty et al., 2021; Obradović et al., 2022). While respondents acknowledged the conservation benefits, a neutral stance on negative impacts suggests the need for addressing potential socio-cultural concerns to further enhance support.

Conclusions

This study delves into the potential and challenges of ecotourism development and local people's perception in Dhanushadham Protected Forest. While the COVID-19 pandemic significantly impacted visitor numbers, recent trends indicate a gradual increase. Locals identified temples and lakes as primary attractions for tourists. Beyond existing opportunities, the study

suggests that establishing a mini zoo, a Maithili museum, homestays, and cultural programs could further enhance the ecotourism potential of the area. The study also identified key challenges for ecotourism development, including political instability, insufficient promotion and marketing, inadequate infrastructure and management, and the absence of a visitor information center. Despite these challenges, the majority of residents expressed optimism about Dhanushadham's ecotourism potential. A dedicated visitor information center would provide essential details about ecotourism sites, facilities, and other relevant information for tourists and visitors to Dhanushadham Protected Forest.

Additional research is crucial to determine the viability of proposed ecotourism products and optimal allocation of funds to support their development in Dhanushadham Protected Forest. Longitudinal studies assessing ecotourism's long-term social, cultural, and economic impacts on local communities, particularly marginalized groups like the Mushar, would provide deeper insights into the sustainability of ecotourism. This includes tracking environmental changes, evaluating community engagement, benefit sharing, and exploring technology's role in promoting ecotourism. Future research should expand beyond Dhanushadham Protected Forest to explore ecotourism dynamics in other protected areas, facilitating comparative analyses and broader generalizations for sustainable tourism development in Madhesh Province and similar contexts.

Study limitations

This study's findings should be interpreted with caution due to inherent limitations. Firstly, the research is based on a case study of a specific area, restricting the generalizability of the results to broader contexts. Secondly, during the household survey, respondents often hesitated to share detailed or accurate information, potentially skewing the data. This reluctance could be attributed to cultural norms or a lack of familiarity with the research process, which might affect the reliability and comprehensiveness of the collected data. Furthermore, the study's non-experimental design limits its ability to establish definitive causal relationships between variables such as local perception and ecotourism outcomes. Finally, the sample size of 86 households, while representative, may not capture the entire complexity of the local community's perspectives on ecotourism. These limitations suggest that future research could benefit from more comprehensive data collection methods, a broader geographical area and a larger sample size.

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