



Potentiality of Ecotourism and Entrepreneurship Development in Mousuni Island of Sundarbans: SWOT- AHP Analysis

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Article History:

Received 19 July
2024

Received in
revised form 09
December 2024

Accepted 29
December 2024

Keywords:

Mousuni
island; Indian
Sundarban
delta; camp
tourism;
ecotourism;
SWOT-AHP
model

Abstract:

Present study intends to assess the current scenario of tourism in Mousuni island, one of the most vulnerable ocean-facing islands of Indian Sundarban delta region, present problems, potentials for development of ecotourism and various entrepreneurship in this island. The present unplanned 'camp tourism' of this island should be promoted to planned 'ecotourism' for the purposes of conservation of local environment, development of local economy and rural livelihoods of people. This study has been carried out with the help of secondary and primary datasets through structured questionnaires for camp-owners, tourists and local people. Collected datasets have been analyzed through SWOT-AHP hybrid model and GIS techniques in order to assess the strengths, weaknesses, opportunities and threats regarding tourism of Mousuni island and provide ideas and strategies for sustainable future planning and management toward the development of ecotourism and entrepreneurship in this island ensuring active participation of local people for their well-being. Here, the main focuses are on generation of strategies for improvement of livelihoods of local people, development of local economy, conservation of nature, achievement of full cooperation and support of administration, development of sustainable infrastructures in the process of establishment of an ideal community-based ecotourism in Mousuni island without hampering its authenticity and unique social identity.

1. Introduction

At present, tourism is emerging as one of the most dominant economic activities in both developed and developing nations of the world. Tourism Society of Britain (1976, as cited in Kamra & Chand, 2009, p. 35) described tourism as ‘temporary short-term movement of people to destinations outside the places where they normally live and work, and activities during their stay at these destinations; it includes movement for all purposes, as well as day visits or excursions’. In India, tourism is also appearing as a growing economic activity due to the vast and diverse physical, social and cultural resources of the country, from Kashmir (north) to Kanyakumari (south) and Arunachal Pradesh (east) to Gujarat (west) as well. India consists of a part of the great Sundarban delta (40% only), world’s largest mangrove forest, extended between Bangladesh and India, which is the home of magnificent Royal Bengal Tiger and saltwater crocodiles. Tourists visit this place from different parts of the country and even from abroad due to attraction of its enriched and exclusive flora and fauna and also its remarkable culture as well.

Tisdell (1997) remarked wildlife spotting is comparatively easier in Indian Sundarbans while vegetation cover is more luxuriant in Bangladeshi Sundarbans. But, here, large scale mass tourism - with all modern amenities available - is not possible due to fragility and vulnerability of this region. Therefore, different forms of sustainable tourism have been developed in Sundarbans which are safe and sound for both the tourists and local environment, and those contribute to the local economy also. According to United Nations Environment Program (UNEP) and World Tourism Organisation (WTO), sustainable tourism is ‘Tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities’ (UNEP & WTO, 2005, p. 12). At present, to protect the nature and for well-being of the locals, *ecotourism* and *homestay tourism* are being promoted as sustainable forms of tourism in different parts of Indian Sundarban delta region.

Ecotourism is viewed as a form of sustainable natural resource-based tourism (Fennell, 2003, as cited in Cobbinah, 2015). It is ecofriendly. Richardson (1993, as cited in Diamantis, 1999) elaborated ecotourism is an ecologically sustainable tourism which basically takes place on natural areas to depict local environment and culture for environmental education of the tourists, promotes environmental conservation and well-being of local people. Asian ecotourism slightly differs from the conventional concepts of Western ecotourism in terms of themes and patterns (Weaver, 2002). Cabral and Dhar (2020) have made an attempt to explore the research gap through an integrative literature review on ecotourism research in India from 1992 to 2017 which indicated only a few or no studies on ecotourism have been carried out in the eastern and western zones of India and most of the studies ignored the role of government, allied agencies, tour operators and tour guides in ecotourism sites. Salam et al. (2000) assumed that ecotourism has been developed in Sundarbans

region primarily in order to protect its flora and fauna. Tisdell (1997) illustrated the problems of ecotourism in Sundarbans in both India and Bangladesh and by a detailed comparison between them he concluded Indian ecotourism in Sundarbans is comparatively more accessible, time-saving, cost-effective and regular than Bangladesh for foreign tourists. Bhuiyan et al. (2011) studied the role of homestay for ecotourism.

Homestay, another form of sustainable tourism, refers to commercialization of one's home in order to utilize the residential space for purpose of profit (Kontogeorgopoulos et al., 2015) where the guest and host share same premise to stay and direct interaction takes place between them. Different forms of homestays such as cultural homestay, farm stay, cottage homestay, heritage homestay etc. mainly develop in rural settings in order to engage the rural community into homestay business and tourism related activities for sustainable development of the locality (Janjua et al., 2021).

Now-a-days, a distinctive form of tourism can also be seen in Sundarbans along with ecotourism and homestay tourism, which is *camp tourism*. In relation to tourism, traditionally camping refers to the outdoor recreational activities of staying in tents in a natural environment for leisure while originally it was associated with vulnerable, less fortunate mobile dwellers forced to live in unpleasant temporary shelters (Rogerson & Rogerson, 2020). It is now viewed as the tourism activity 'involves sleeping at least one night in a recreational vehicle (RV), caravan, cabin, or other type of temporary shelter where the comforts of home can be enjoyed' (Brooker & Joppe, 2014, p. 1). The word 'camp' denotes such temporary shelters to stay where permanent buildings are not available.

In Mousuni, a small vulnerable island situated at the western part of Indian Sundarban delta, camp tourism has been mainly developed along the coastline in southern part of the island where tourists are provided accommodation and food in temporary shelters like cottages, tents and mud houses by local camp-owners. Structures of the camps mainly reflect the local rural culture and home-made local foods are being served in breakfast, lunch, supper and dinner to the tourists in a rural homely environment. It represents a distinctive form of *rural tourism* also. Liu (2006) remarked rural tourism is one of the priority tools for rural planning in Malaysia. Falak et al. (2014) also studied rural tourism in Malaysia concentrating on community development.

Although tourists are coming and enjoying a unique experience in Mousuni island, this newly developed unplanned tourism is facing several barriers and problems since its initiation due to vulnerability and hazard prone nature of this island and lack of infrastructure, administrative and investment support. Besides, tourism of Mousuni island has not gained high popularity and full attention of the tourists yet. Today, many residents of this island are dependent on tourism-based activities for

their livelihood. Thus, in this background, development of planned and authorised ecotourism as an alternative through active engagement of local community is necessary in Mousuni island which may be more beneficial for the island's local economy and environment as well as well-being of the local people. Cabral and Dhar (2020) remarked community-based ecotourism is the best strategy for environmental conservation and management, socio-cultural and economic development of local community in vulnerable areas. Dey et al. (2020) analysed attitudes of local people for community-based ecotourism in Sundarbans and remarked that local people are satisfied with this community-based ecotourism process. A study has been made by Islam et al. (2013) on the conservation of flora and fauna in the Bangladeshi part of Sundarban delta through community-based tourism activity. Birendra (2021) mentioned wildlife conservation and sustainable livelihood happened through community-based homestay ecotourism.

In order to engage the local people of Mousuni island in this community-based ecotourism, at first, their entrepreneurial skills should be developed through proper training thereby they can manage this business on their own in an effective and sustainable way. Here, entrepreneurship refers to the process of setting up new business related to ecotourism through adequate utilisation of local resources which may contribute in empowerment of the local community (Mulyono et al., 2020) in this rural area and sustainable development also. Tourism-based entrepreneurship is identified as one of the key strategies for rural development (Shiri & Saymohammadi, 2023) as it contributes in the socio-economic development as well as well-being of the local people. It may be pointed out that some specific factors may affect the entrepreneurial skills such as relationships with national cooperatives, institutional regulatory environment and economic market environment (Deakins et al., 2016).

The main aim of this study is sustainable development of Mousuni island through development of sustainable tourism processes and entrepreneurial skill development among local rural people in here to engage them within this process. Therefore, in this study, the potentials for establishment of community-based ecotourism and various scopes for entrepreneurship development related to tourism for the local residents of Mousuni island have been analysed through the application of SWOT-AHP model in the context of identification and close examination of problems and contemporary condition of the present camp-owners here in order to promote sustainable ecotourism in this island and raising awareness and consciousness among people regarding the necessity of development of sustainable ecotourism in Mousuni island. In this background, some research questions arise such as: Why ecotourism is significant in Mousuni island instead of mass tourism? What is the contemporary condition of the present camp tourism in Mousuni island? What are the problems of present tourism industry in this island? What type of measures are required for sustainable development of tourism in this island?

2. Study Area

According to WWF India (2010, as cited in Mukherjee & Siddique, 2018), there are total ten most vulnerable ocean-facing islands in Indian Sundarban delta region which includes Mousuni island, situated about 120 kilometers southwards from Kolkata in South 24 Parganas district in the state of West Bengal (Fig. 1). This small island is a *gram panchayat* in Namkhana block under Kakdwip subdivision. Muriganga or Bartala River is situated in the west and north-west of the island while Pitt's Creek or Chinai River and Bay of Bengal surround the east and south of the island respectively. It covers an area of approximately 24.11 sq. km. and the total population of this island is 22073 (Census of India, 2011). Through field survey it is observed that main occupations of inhabitants of this island are farming, fishing, building and tourism related activities. The whole island is divided into four villages or revenue *mouzas* which are Mousuni, Bagdanga, Kusumtala and Baliara from northward to southward respectively. The total length of coastline of this island is 40.19 km. (Chaudhuri, 2012). Sea-beach is situated along south-western and southern margin of this island, whereas, the camp tourism has been mainly developed in Baliara *mouza* along the sea-side. Therefore, the southern part of this island i.e. Baliara *mouza* is primarily selected as the study area.

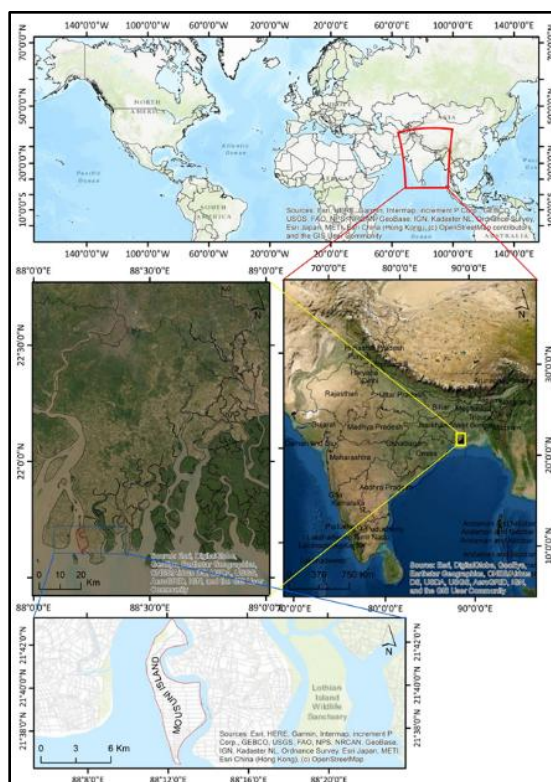


Fig. 1: Location map of Mousuni island. (Based on links by ArcGIS on services.arcgisonline.com; Accessed on 2nd July, 2021)

3. Database and Methodology

This study is mainly based upon primary data which have been collected through field surveys conducted during 2022 to 2023 in Mousuni island. Besides primary data, some secondary data have also been used from eminent publications, government reports and authentic websites.

Here, a survey has been carried out to the camp-owners, local people and tourists based on structured questionnaires in order to identify the problems and analyse the contemporary condition of the existing camp tourism in the study area. The survey was mainly focused on the tourist camps of Mousuni island. Following a purposive sampling procedure, total 20 camps out of approximately 60 functional camps of this island have been surveyed as well as responses from groups of tourists and local families have also been recorded for this study. Satellite imageries and GIS software have been used in this study to prepare different geospatial maps. A land use survey has also been followed to identify the physical problems of the study area.

For the purpose of strategic planning and sustainable management of future tourism in Mousuni island, Strengths-Weaknesses-Opportunities-Threats (SWOT)-Analytic Hierarchy Process (AHP) model, simply SWOT-AHP model, is used as a hybrid method which has been previously applied by many authors in their works (Wickramasinghe & Takano, 2009; Fabac & Zver, 2011; Jeon & Kim, 2011; Oreski, 2012; Das & Roy, 2019; Shiri & Saymohammadi, 2023). According to Jeon and Kim (2011), a SWOT-AHP hybrid method was introduced by Kurttila et al. (2000) to improve the usability of SWOT analysis through preciseness and quantitative examination of the SWOT factors and groups with the application of AHP analysis, widely used for solving multiple criteria decision-making problems, which was initially developed by Saaty in 1980. In this method, at first, SWOT analysis has been done under the supervision of experts through selection of several parameters under the Strengths, Weaknesses, Opportunities and Threats of tourism of Mousuni island separately on the basis of collected data. Then, AHP has been applied to compare in pairs between SWOT factors within each SWOT group and compare in pairs between the four SWOT groups (Jeon & Kim, 2011) in order to quantify the importance of each group compared to each other. In AHP Analysis, Saaty's Fundamental Scale (Saaty, 2000) has been used for the calculation of pairwise matrix. After that, normalized matrix and criteria weight (row-wise average) have been calculated. Then, consistency of the matrix has been measured using the following formula of Consistency Ratio (CR):

$$CR = \frac{CI}{RI} \quad (1)$$

Where, CI is the Consistency Index which can be computed through the following equation:

$$CI = \frac{\lambda_{\max} - N}{N - 1} \quad (2)$$

Here λ_{\max} is the Principal Eigen Value (Han & Tsay, 1998, as cited in Ghosh & Sahu, 2023) which can be estimated approximately by dividing the row-wise weighted sum of the matrix by criteria weight. RI is the random consistency index which is a unit less predefined continuous value depended upon the size of matrix as given by Saaty (2000). If the value of CR is < 0.1 then it is acceptable and consistent (Ghosh & Gope, 2021).

Finally, alternative strategies for future planning and management of tourism of Mousuni island in a more sustainable way for its further development has been defined through using TOWS matrix which is the next step of SWOT, developed by Weihrich in 1982 (Wickramasinghe & Takano, 2009). TOWS matrix has four specific strategic groups to generate alternative strategies, which are Strengths-Opportunities (SO), Weaknesses-Opportunities (WO), Strengths-Threats (ST) and Weaknesses-Threats (WT).

4. Results and Discussions

4.1. An Overview of Tourism in Mousuni island

Instead of large-scale mass tourism, ‘camp tourism’ or several camps have been developed along the sea-side mainly over the southern part of Mousuni island where tourists are accommodated in tents, cottages and mud houses in natural rural environment (Fig. 2). In the camps of Mousuni, tourists can enjoy the nature and view of sea with fresh home-made local foods especially fishes, crabs and other sea-foods served by the local staffs. It is assumed that the first initiative of this camp tourism in Mousuni island was in 2016. Thereafter, several camps have been established one by one in an unplanned manner. Therefore, this tourism activity of Mousuni island is new and unplanned.

According to the survey and local information, at present, there are around 60 camps functioning in this island, whereas, about ten camps have been submerged already under seawater. According to our sample survey, total 45% of the camp-owners are local people, while 30% camps are owned by external travel agencies (mainly Kolkata based) and 25% camps are operated by joint partnership between local people and any external travel agency. Workers of the camps are mostly local people and from family members of the camp-owners. Women participations are highly observed especially for cooking and males are engaged for serving foods, cleaning tents and cottages as well as total maintenance of the camps. According to the data given by camp-owners and staffs, highest number of tourists visit here in the months of November to January, during winter season. In this period, tents are booked mostly, while entire the year cottages are under high preference by tourists who arrive with family for a comfortable stay. About 90% of tourists come here from Kolkata. Fig. 3 shows types and percentage distribution of the preference of

accommodation of tourists based on field survey which depicts maximum demand for tents in Mousuni island. The most visited places of Mousuni island are Baliara beach, mangrove forest (a plantation program of the Government of West Bengal), and Kankramari *char* which is famous for migratory birds during winter season.

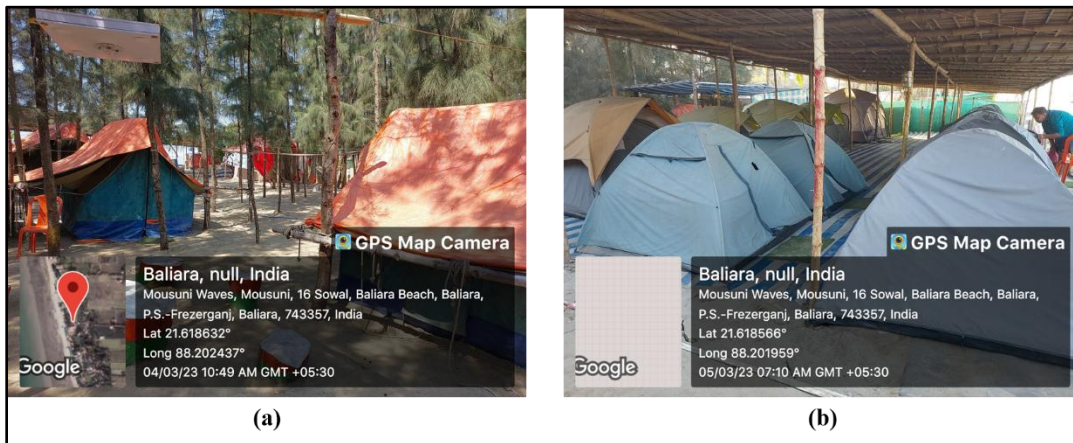


Fig. 2: (a) Camp tourism in Mousuni island. (b) Dome tents in a camp of Mousuni island. (Photograph taken during field survey in Mousuni island, 2023)

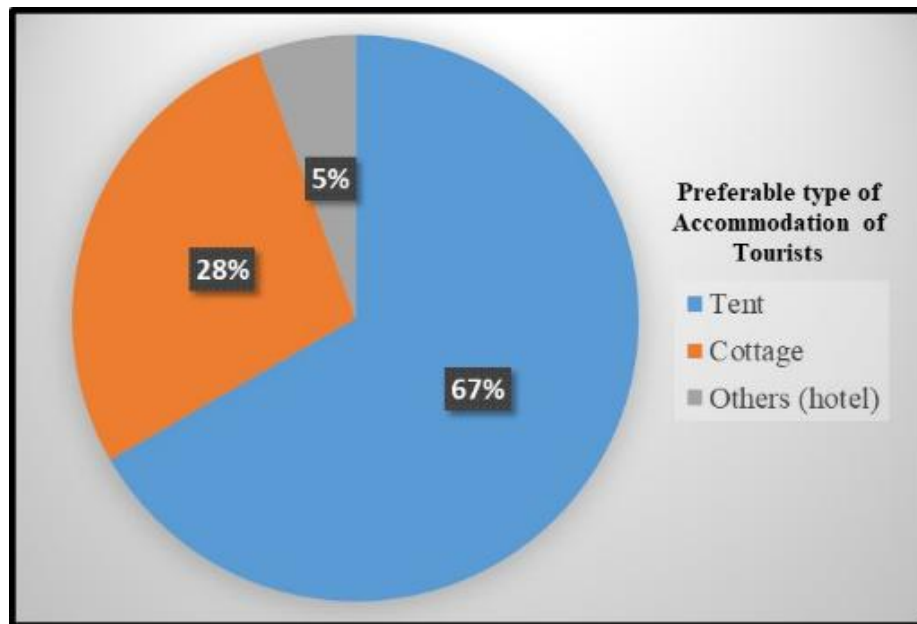


Fig. 3: Tourists' preferences towards suitable accommodation type to stay in Mousuni island. (Source: Field survey in Mousuni island, 2022)

4.2. Problems of Tourism in Mousuni island

The tourism of Mousuni island is mostly affected by severe physical problems due to vulnerability of this island. The island is facing severe coastal erosion and loss of

land due to several reasons. More than 14% of land mass have been lost since 1969 (Sundar & Sannasiraj, 2016) and the whole island may sink within 80-100 years if the present trend of erosional activities continues (Karmakar et al., 2020). Besides, occurrences of cyclones and storm surges are observed frequently in this island which affect the tourism industry along with day-to-day life of local people. In May, 2020, the Amphan super cyclone extensively affected this island with huge amount of destruction of properties. The embankments were breached severely. Many local people were displaced. Large scale coastal erosion and inundation of land caused submergence of approximately ten camps into the sea.

Here, tidal surges also induce coastal erosion and repeated breaching of the poor embankments which lead to flood and inundation, displacement of people and destruction of properties. These events have enforced the people of Mousuni island to become climate refugees. As most of the camps are situated along the sea-beach (Fig. 4), they have to face the worst scenario of such natural calamities and finally produce great financial losses. There is also a true transportation gap due to presence of waterbody around this island which interrupts the smooth flow of tourists here. Thus, the camp-owners have to suffer a lot of difficulties due to various physical problems present in Mousuni island.

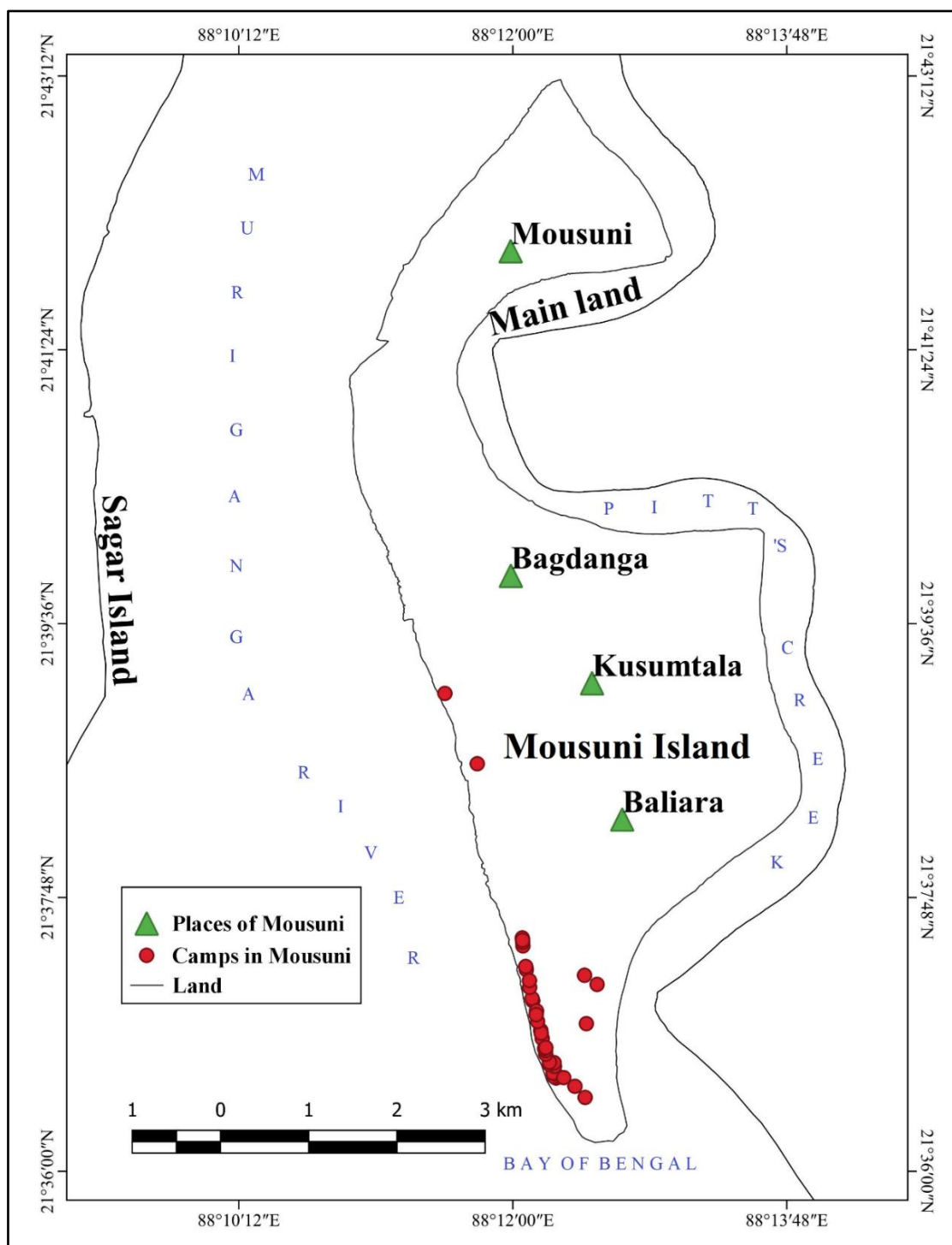


Fig. 4: Present location of the camps in Mousuni island. (Based on Google Earth Pro; Accessed on 6th May, 2023)

Beside physical problems, administrative problems are a great hindrance to the development of tourism in this island. Lack of maintenance and poor condition of riverine embankments due to administrative difficulties cause flood, inundation, loss of properties and those all make the lives of people of this island hard. The present camp-owners have not received any proper administrative recognition yet for their camp tourism in Mousuni island due to different ‘law and order’ difficulties. Therefore, they do not get any financial or promotional support or cooperation from the government. Although, sometimes they have taken the land in lease from *panchayat* to run their business, the *panchayat* also does not give its full cooperation or support to the camps. Thus, most of the camps suffer from financial losses and lack of funds in order to run their business in an adverse environment both physically and socially. It leads to inadequate infrastructure and absence of basic facilities in the camps such as lack of adequate waste disposal facility, lack of properly purified drinking water etc. In addition, there is lack of entrepreneurial skill among local workers which can create barriers and difficulties to run this kind of business.

Unmonitored or uncontrolled tourist activities in this island create environmental pollution and degradation. Apart from that, according to local sources, each year a significant number of youths migrate from Mousuni island to the adjacent urban areas or outside the state for educational and professional purposes which may create shortage of workers in tourism industry of this island in near future. Fig. 5 highlights opinions of camp owners regarding various physical and human induced problems in this island in a nut shell.

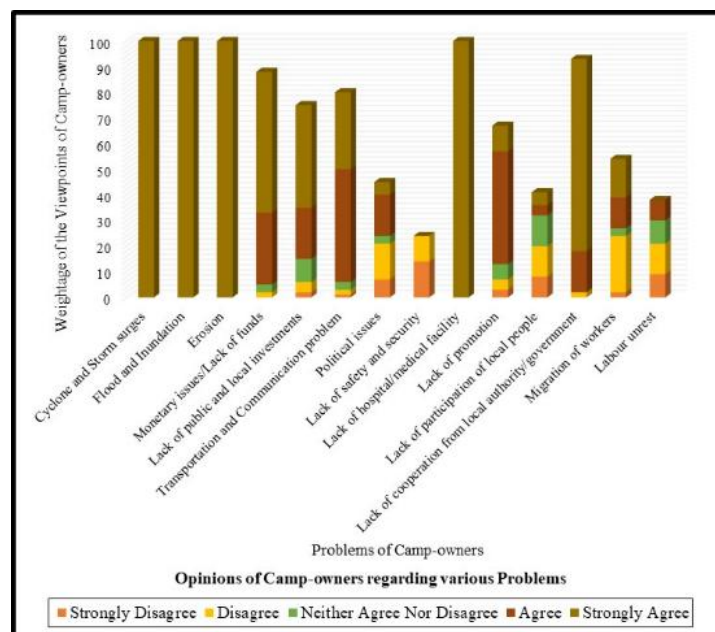


Fig. 5: Problems faced by the present camp-owners in Mousuni island. (Source: Field survey in Mousuni island, 2022)

4.3. SWOT Analysis of Tourism Industry of Mousuni island

For a strategic future planning and management of tourism industry of Mousuni island in a more sustainable way a Strengths-Weaknesses-Opportunities-Threats (SWOT) analysis (Table 1) has been worked out. Here, the strengths and weaknesses are internal factors which are already present within the island and affecting its tourism. Opportunities and threats are external factors which may affect the tourism industry of Mousuni in future. Several parameters have been taken under strengths, weaknesses, opportunities and threats on the basis of data collected during field survey (Fig. 3, 6, 7 & 8) and review of previous literature. The main aim of SWOT analysis is achievement of opportunities that greatly suit the present strengths through overcoming the weaknesses and utilising present strengths to decrease the vulnerability of tourism industry to threat. Weaknesses should also be prevented in order to restrain this tourism industry of Mousuni island from sensitivity to threats (Gürel & Tat, 2017).

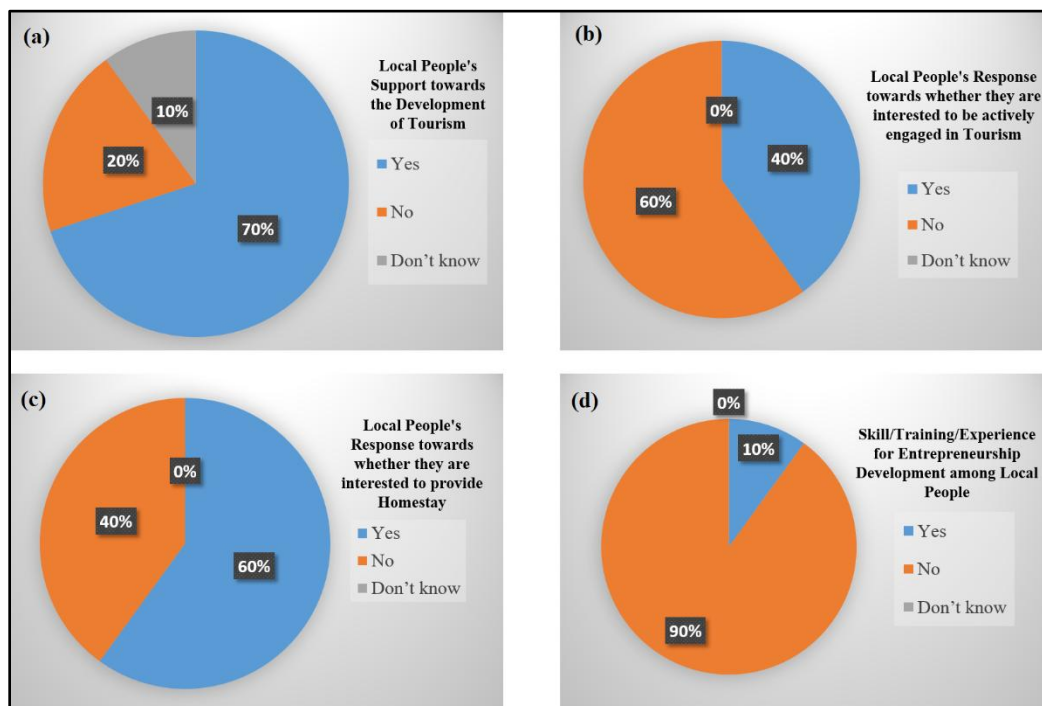


Fig. 6: (a) Local peoples' support towards the development of tourism in Mousuni island. (b) Local peoples' responses about their interest towards active participation in the tourism of Mousuni island. (c) Local peoples' responses towards whether they are interested to provide homestay to the tourists at their home in Mousuni island. (d) Existence of any previous skill, training or experience among the local people of Mousuni island for entrepreneurship development. (Source: Field survey in Mousuni island, 2022)

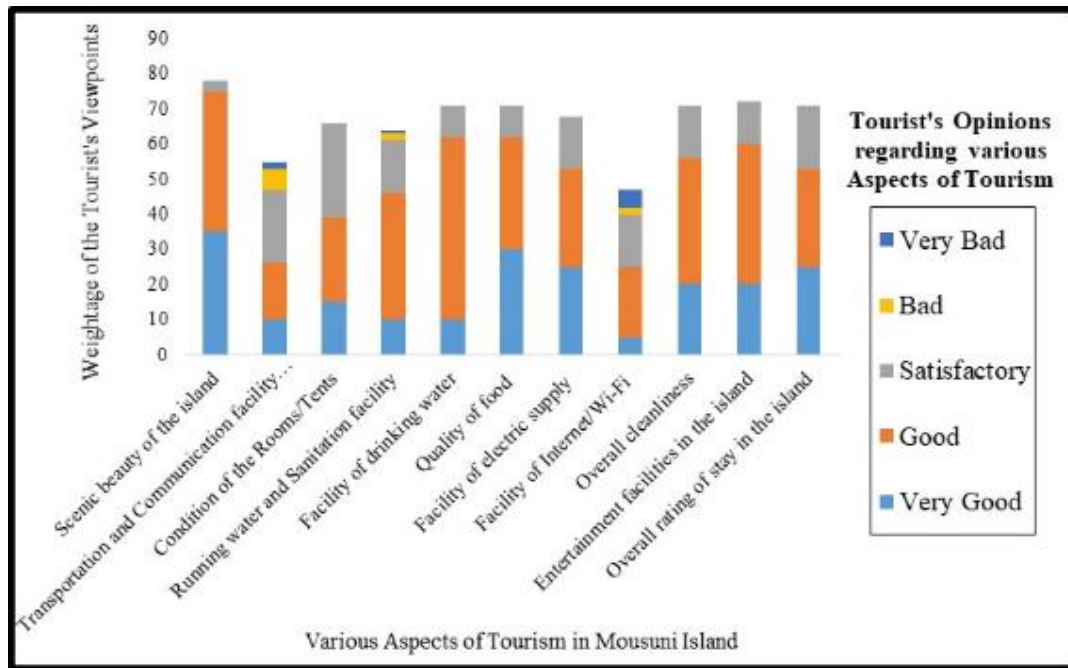


Fig. 7: Tourists' responses towards the present aspects of tourism in Mousuni island. (Source: Field Survey in Mousuni island, 2022)

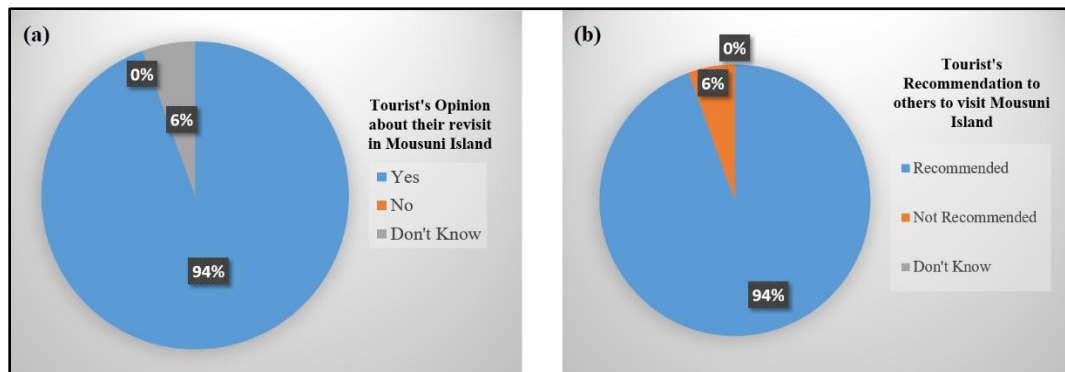


Fig. 8: (a) Tourists' opinion about their revisit in Mousuni island for outing. (b) Tourists' recommendation to others to visit Mousuni island for outing. (Source: Field survey in Mousuni island, 2022)

Table 1. SWOT Analysis

Internal Factors	
Strengths	Weaknesses
Existing natural resources for tourism (S1)	Frequent occurrence of natural hazards (W1)
Low rate of crime (S2)	Lack of proper medical facility (W2)
No barriers for market entry (S3)	Lack of opportunities for locals to develop entrepreneurial skills (W3)
Positive attitude of locals toward tourism (S4)	Transportation or Communication gap due to the presence of waterbody (W4)
Authentic tourism experiences (S5)	Lack of public and local investment (W5)
Increasing demands of the tourism products (S6)	Lack of purified drinking water (W6)
Transfer accessibility to the nearest railways and roadways terminals or stations (S7)	Lack of promotion (W7)
Willingness of locals to get engaged as tourism entrepreneurs (S8)	Migration of youths to the adjacent urban areas (W8)
	Unmonitored tourist activities (W9)
	Lack of ATM and banking facility (W10)
	Share of market (W11)
External Factors	
Opportunities	Threats
Economic growth and employment opportunities (O1)	Vulnerability of the island due to the slow rate of submergence of it (T1)
Enrichment of local economy through new markets and segments (O2)	Degradation of coastal ecosystem (T2)
Potentiality for development of Ecotourism (O3)	Possibility of ban on tourism by government due to lack of medical facility to the tourists and probability for a large-scale medical disaster (T3)

Strengthening and improving social identity (O4)	Environmental Pollution and Degradation (T4)
Development of women empowerment (O5)	Possibility of destruction of authenticity of the place due to new market entrants (T5)
Promotion of local products as authentic tourist experiences (O6)	Lack of staffs or workers in tourism industry in future due to high rate of migration of youths to the adjacent urban areas (T6)
Potentials for the development of Cruise tourism (O7)	
Safe and secure environment for the tourists (O8)	

4.4. AHP Analysis of the SWOT Factors

The Analytic Hierarchy Process (AHP) analysis has been done to quantify each factor and group of SWOT in order to determine the importance of each group and factor in comparison to each other (Table 2). In pairwise matrices the weightage has been assigned according to Saaty's Scale to each factor and group of SWOT on the basis of importance compared to each other. Ranking has been done in accordance with the data collected from field survey. Here, the most important factor or group is ranked first, whereas, the least important one is ranked last. It may be pointed out that this is highly subjective and has been prepared with utmost care under the supervision of tourism experts.

Table 2. Individual and Total Criteria Weight of each Factors and Groups of SWOT

SWOT Groups	Criteria Weight	SWOT Factors	Individual CW	Final Weight	% of weight
S	0.249601276	S1	0.324766187	0.08106205	8.106
		S2	0.225274185	0.05622872	5.623
		S3	0.154687381	0.03861017	3.861
		S4	0.105346516	0.02629462	2.629
		S5	0.070873516	0.01769012	1.769
		S6	0.070873516	0.01769012	1.769
		S7	0.027747152	0.00692572	0.693
		S8	0.020431546	0.00509974	0.510

W	0.156997608	W1	0.220531851	0.03462297	3.462
		W2	0.220531851	0.03462297	3.462
		W3	0.153640692	0.02412122	2.412
		W4	0.108054081	0.01696423	1.696
		W5	0.074577233	0.01170845	1.171
		W6	0.074577233	0.01170845	1.171
		W7	0.051918747	0.00815112	0.815
		W8	0.036752363	0.00577003	0.577
		W9	0.026183453	0.00411074	0.411
		W10	0.018949056	0.00297496	0.297
		W11	0.01428344	0.00224247	0.224
O	0.513955343	O1	0.26046161	0.13386564	13.387
		O2	0.26046161	0.13386564	13.387
		O3	0.171916617	0.08835746	8.836
		O4	0.116407472	0.05982824	5.983
		O5	0.079307276	0.0407604	4.076
		O6	0.054381522	0.02794967	2.795
		O7	0.035020804	0.01799913	1.800
		O8	0.022043089	0.01132916	1.133
T	0.079445774	T1	0.395628497	0.03143101	3.143
		T2	0.241684936	0.01920085	1.920
		T3	0.184621865	0.01466743	1.467
		T4	0.098974624	0.00786312	0.786
		T5	0.051254185	0.00407193	0.407
		T6	0.027835892	0.00221144	0.221

Here, the Opportunities (O) have highest criteria weight, whereas, the Threats (T) have lowest criteria weight. Strengths (S) have higher criteria weight than Weaknesses (W). Thus, Opportunities and Strengths have higher criteria weight than Weaknesses and Threats. Therefore, it may be concluded that there are higher

chances for future opportunities to be accomplished through utilizing the present strengths by minimizing the present weaknesses to mitigate the future threat. Some well-planned strategies should be followed in order to achieve such condition. Here, the Consistency Ratio (CR) is less than 0.1 in each and every case (Table 3). Therefore, the decision is considered as consistent and accepted.

Table 3. Consistency Checking

Variables	SWOT Groups	SWOT Factors			
		S	W	O	T
CI	0.058963	0.047648	0.050476	0.035449	0.05336
RI	0.89	1.40	1.51	1.40	1.25
CR (CI/RI)	0.066251	0.034034	0.033428	0.025321	0.042688

4.5. Formulation of Alternative Strategies for Sustainable Development of Tourism in Mousuni island using TOWS Matrix

Here, the TOWS matrix (Table 4) has been used to design the alternative strategies needed for future planning and management toward the development of sustainable tourism in Mousuni island. Among the four groups of TOWS, the SO strategies are Maxi-Maxi strategies which is used to take advantage of external opportunities through maximum utilisation of internal strengths, whereas, the WO strategies are Mini-Maxi strategies to take the advantages of external opportunities in order to reduce internal weaknesses, the ST strategies are Maxi-Mini strategies to mitigate or reduce the threats with proper utilisation of internal strengths, while, the WT strategies are Mini-Mini strategies to adopt defensive methods in order to decrease or mitigate the internal weaknesses and external threats (Wickramasinghe & Takano, 2009).

Table 4. TOWS Matrix for Sustainable Planning and Management of Tourism in Mousuni island

	Strengths	Weaknesses
O	SO Strategies (Maxi-Maxi)	WO Strategies (Mini-Maxi)
p	Wider scopes are available for conservation of nature and socio-economic development of people of Mousuni Island through establishment of sustainable ecotourism with proper utilisation of local natural resources, facilities and favourable conditions in	Active cooperation and financial support from government and local authority are the primary needs to protect this island from natural calamities through proper maintenance of the river bunds and advanced embankment of the coastline of this island. Government should take
p		
o		
r		
t		

u n i t i e s	this island and more active engagement of local people which may create opportunities for various entrepreneurship also. These will help to strengthen and improve the social identity of this island (S1/S2/S3/S4/S7/S8/O1/O3/O4/O5/O8)	necessary steps for active promotion of tourism of Mousuni Island, whereas, transportation and communication system of this island should be more developed like more frequent ferry services, establishment of cruise transportation services, etc., in order to attract more tourists towards this authentic tourism experience of this island and promote sustainable ecotourism (W1/W4/W5/W7/ O3/O6/O7)
T h r e a t s	<p>ST Strategies (Maxi-Mini)</p> <p>There are already provisions for authentic tourism experiences in Mousuni Island through its nature-based camp tourism or tent tourism which are leading to the increase in demand for these exclusive tourism products. Here this existing tourism should be promoted into more sustainable, planned and more authentic community-based ecotourism which may create more employment opportunities, better economic growth and opportunities to develop entrepreneurial skills for the local people of this island. This will lead to higher standard of living and well-being of the locals which may attract the local youths to stay in this island and get actively involved in this tourism business (S1/S5/S6/T5/T6)</p>	<p>WT Strategies (Mini-Mini)</p> <p>In order to protect the island, proper mitigation strategies should be followed to combat the natural disasters and reduce the vulnerability of this island. Development of some basic infrastructures and facilities in Mousuni Island such as establishment of a new government hospital, proper facilities of waste disposal system, improvement of banking and ATM facilities, adequate supply of purified drinking water, application of strict rules and regulations for the tourists and camps in order to control unmonitored tourist activities for social and environmental safety purposes are mandatory for all round development of this island (W1/W2/W6/W9/W10/T1/T2/T3/T4)</p>

4.6. Potentials for Development of Ecotourism in Mousuni island

Ecotourism is based upon distinctive principles revolving around the concept of sustainable development. After examining 85 definitions of ecotourism, Fennel (2001) analyzed the most frequent variables used in the definitions of ecotourism are: place of ecotourism (mainly in natural areas), conservation, culture, benefits to locals and education whereas conservation, education, ethics, sustainability, impacts and local benefits are mostly emphasized in recent trending definitions. Cobbinah (2015) identified five fundamental principles of ecotourism which are:

environmental conservation, cultural preservation, community participation, economic benefits and empowerment of vulnerable groups.

In Mousuni island, lots of above potentials are present to develop ecotourism. As mass tourism is not possible due to inaccessibility and vulnerability of this island, ecotourism can be developed here as one of the best options for sustainable tourism and also as an alternative of mass tourism. The existing natural resources of this island like sea-beach, mangrove forest, migratory birds, natural scenic beauty and other marine or riverine resources are the main bases for establishment of nature-based ecotourism where tourists can learn about nature in a natural setting. Opportunities are also available for promotion of the existing unplanned camp tourism into more suitable and sustainable, planned and authorised ecotourism as the existing tourist accommodation types like tents, cottages or mud houses are eco-friendly in nature and reflect the local rural culture which can be used in future ecotourism and would be cost effective and beneficial for the present camp-owners also. In this context, it can be assumed the new ecotourism should properly maintain the guidelines of Coastal Regulation Zone (CRZ) norms of India. There are abundant land resources for construction and development of such ecotourism in this island. Presently, as a large number of people of Mousuni island depends on tourism related activities for their livelihoods, there is adequate scope for more active participation and full engagement of local people in tourism industry of this island which is an essential component of ecotourism.

4.7. Scopes for Entrepreneurship Development for the Residents of Mousuni island

Various scopes are available for local people of Mousuni island to develop entrepreneurship related to tourism through utilisation of local resources in a sustainable way. These will contribute in the development of local economy as most of the people of this island are poor or below poverty level and thus these types of activities are needed for their well-being. According to Skrbic et al. (2019), successful business and development policy in tourism depends upon acquiring the concept of entrepreneurship and sustainable tourism. They also added the main element of entrepreneurship is innovation which helps to resolve environmental issues as entrepreneurs put the stress on individual, environmental and entrepreneurial process itself, and government should focus on motivated and skilled people who have financial means to start a business in order to create a suitable entrepreneurial environment. Banerjee and Shiva (2016) analysed present problems and prospects of existing community-based ecotourism in the village of Bali in Indian Sundarban delta region with emphasis on the conservation of nature and development of livelihoods and entrepreneurship skills among local people. Here, some of the available opportunities in Mousuni island to develop entrepreneurships are discussed in brief.

At first, some of the local residents can start the business of homestay in their own premises where they will provide accommodation to the tourists in a homely environment and provide them home-made food for a particular rent if proper provisions or infrastructures are available. In this way the tourists can enjoy the rural life of local people directly. Secondly, small cruise business can be developed by the local people to arrange a luxurious but safe and short trip for the tourists in and around the island. Thirdly, the residents of this island can open shops of jaggery, crafts made with coconut shells (e.g. boxes, pots, containers, powder cases etc.), various crafts, jewellery or home-decorating items made with marine resources like shells of oysters, conch etc. and they can also open restaurants which will serve exclusive local sea-food items like nearby Bakkhali beach in Sundarbans. Lastly some water games or beach sport activities can be arranged for the tourists by local residents which will be safe for both tourists and nature. These will help to promote the local products as authentic tourist experiences and strengthen the social identity of Mousuni island.

5. Conclusion

Despite several problems, tourism of Mousuni island in Indian Sundarban delta is developing as a new weekend destination for the tourists from Kolkata and its nearby places. Few tourists are also coming from other states of India to enjoy its authentic tourism experiences. Many tourists are now preferring to stay in tents to enjoy this unique experience. Therefore, more attention should be given toward the development of this 'camp tourism' in a more sustainable way. According to this study, several opportunities are available for development of sustainable tourism in Mousuni island and a thorough SWOT-AHP analysis has indicated a positive output for establishment of such type of tourism in this island. On the basis of result of the SWOT-AHP analysis it may be concluded that, as Opportunities (O) and Strengths (S) have gained higher criteria weight, therefore, such opportunities can be achieved only through active assistance and cooperation among government, local *panchayat*, local people and present camp-owners and sustainable utilization of local resources in order to overcome the present problems to mitigate the future threats of this island. In this background, government should take immediate actions against the vulnerability of this island and promote sustainable ecotourism to protect the nature and for well-being of the rural local people. Cabral and Dhar (2020) indicated lackadaisical approach of government towards development of ecotourism has caused various challenges and problems in Indian Sundarbans due to slow progression or improper implication of ecotourism principles. Proper and advanced embankment protection work should be done immediately in the coastal areas of Mousuni as it has been done in other coastal tourist places in West Bengal like Bakkhali and Digha. Different coastal structures such as sea dyke, sea wall, groynes, jetties, wave breakers etc. are needed to be constructed over the coastal areas of this island as these measures are effective in Digha Planning Area to reduce coastal

erosion (Sahu, 2008). *Panchayat* and local people of Mousuni should also come forward and give their full cooperation and assistance for the development of this island. Awareness campaigns should be arranged in order to raise consciousness among tourists, camp-owners and local people about the necessity of sustainable ecotourism in this island. Moreover, this issue of Mousuni island should be highlighted among the environmentalists, geologists, geographers and other scientists, and in upper administrative levels in order to protect this island and its inhabitants in a scientific and ecological way.

Acknowledgements

The first author would like to acknowledge the RUSA Component- 10 (Entrepreneurship and Career Hub), University of Kalyani, for the financial support as Principal Investigator [Project sanction order: IP/RUSA(C-10)/09/2021 Dated: 26-11-2021] to carry out the research work presented in this paper. We are also thankful to Dr. S. Das, Department of Geography, Presidency University, Kolkata, as a tourism specialist for his valuable guidance to conduct this research. The authors thank the editor-in-chief for acceptance of the paper. We are also greatly thankful to the research scholars of the department and tourists, camp-owners and local people of Mousuni island for their assistance in the processing of field survey.

References

- Banerjee, M., & Shiva, P. (2016). Eco - Tourism in Sunderbans: A Life Line for Local People And The Ecology. In K. K. Verma (Ed.), *Journal Global Values* (pp. 25-39). JOURNAL ANU BOOKS.
- Bhuiyan, M.A.H., Siwar, C., Ismail, S.M., & Islam, R. (2011). The Role of Home Stay for Ecotourism Development in East Coast Economic Region. *American Journal of Applied Sciences*, 8(6), 540-546. <https://doi.org/10.3844/ajassp.2011.540.546>
- Birendra, K.C. (2021). Ecotourism for wildlife conservation and sustainable livelihood via community-based homestay: a formula to success or a quagmire? *Current Issues in Tourism*, 24(9), 1227-1243. <https://doi.org/10.1080/13683500.2020.1772206>
- Brooker, E., & Joppe, M. (2014). A critical review of camping research and direction for future studies. *Journal of Vacation Marketing*, 1-17. DOI: 10.1177/1356766714532464
- Cabral, C., & Dhar, R. L. (2020). Ecotourism research in India: from an integrative literature review to a future research framework. *Journal of Ecotourism*, 19(1), 23-49. <https://doi.org/10.1080/14724049.2019.1625359>
- Census of India. (2011). *District Census Handbook, South Twenty Four Parganas, Village and Town Directory* (Directorate of Census Operations), 20(XII-A). West Bengal. Available at: <https://censusindia.gov.in/nada/index.php/catalog/1362> (Retrieved on 02.05.2023).

- Chaudhuri, J. (Ed.). (2012). *Living with changing climate: Impact, vulnerability and adaptation challenges in Indian Sundarbans*. Centre for Science and Environment.
- Cobbinah, P. B. (2015). Contextualising the meaning of ecotourism. *Tourism Management Perspectives*, 16, 179–189. <https://doi.org/10.1016/j.tmp.2015.07.015>
- Das, M., & Roy, P.B. (2019). Geotourism Potential of Gangani, West Bengal, India: A SWOT-AHP Approach. *TEAM Journal of Hospitality and Tourism*, 16(1), 1-8.
- Deakins, D., Bensemann, J., & Battisti, M. (2016). Entrepreneurial Skill and Regulation: Evidence from Primary Sector Rural Entrepreneurs. *International Journal of Entrepreneurial Behavior & Research*, 22(2), 234–259. <https://doi.org/10.1108/IJEBr-12-2014-0240>
- Dey, T., Kamruzzaman, M., Islam, M.A., Bachar, B.K., & Pitol, M.N.S. (2020). Attitudes of local people towards community based eco-tourism in the Sundarbans. *International Journal of Business, Management and Social Research*, 9(2), 528-535. <https://doi.org/10.18801/ijbmsr.090220.55>
- Diamantis, D. (1999). The Concept of Ecotourism: Evolution and Trends. *Current Issues in Tourism*, 2(2 & 3), 93–122. <https://doi.org/10.1080/13683509908667847>
- Fabac, R., & Zver, I. (2011). APPLYING THE MODIFIED SWOT–AHP METHOD TO THE TOURISM OF GORNJE MEĐIMURJE. *Tourism and Hospitality Management*, 17(2), 201–215.
- Falak, S., Chiun, L.M., & Wee, A.Y. (2014). A repositioning strategy for rural tourism in Malaysia - community's perspective. *Procedia - Social and Behavioral Sciences*, 144, 412–415. <https://doi.org/10.1016/j.sbspro.2014.07.310>
- Fennell, D. A. (2001). A Content Analysis of Ecotourism Definitions. *Current Issues in Tourism*, 4(5), 403–421. <https://doi.org/10.1080/13683500108667896>
- Ghosh, M., & Gope, D. (2021). Hydro-morphometric characterization and prioritization of sub-watersheds for land and water resource management using fuzzy analytical hierarchical process (FAHP): a case study of upper Rihand watershed of Chhattisgarh State, India. *Applied Water Science*, 11(17), 1-20. <https://doi.org/10.1007/s13201-020-01340-x>
- Ghosh, M., & Sahu, A.S. (2023). Delineation of groundwater potential zones using AHP and GIS techniques: a case study in Barakar river basin, India. *Arabian Journal of Geosciences*, 16(157), 1-20. <https://doi.org/10.1007/s12517-023-11253-z>
- Gürel, E., & Tat, M. (2017). SWOT ANALYSIS: A THEORETICAL REVIEW. *The Journal of International Social Research*, 10(51), 994–1006. <https://doi.org/10.17719/jisr.2017.1832>
- Islam, M.W., Rahman, M.M., Iftekhar, M.S., & Rakkibu, M.G. (2013). Can community-based tourism facilitate conservation of the Bangladesh Sundarbans? *Journal of Ecotourism*, 12(2), 119- 129. <https://doi.org/10.1080/14724049.2013.820309>

- Janjua, Z. U. A., Krishnapillai, G., & Rahman, M. (2021). A Systematic Literature Review of Rural Homestays and Sustainability in Tourism. *SAGE Open*, 11(2), 1-17. <https://doi.org/10.1177/21582440211007117>
- Jeon, Y.A., & Kim, J.S. (2011). *AN APPLICATION OF SWOT-AHP TO DEVELOP A STRATEGIC PLANNING FOR A TOURIST DESTINATION*. Available at: https://scholarworks.umass.edu/cgi/viewcontent.cgi?article=1243&context=gradconf_hospitality (Retrieved on 02.05.2023).
- Kamra, K.K., & Chand, M. (2009). *Basics of Tourism: Theory, Operation and Practice*. Kanishka Publishers: New Delhi.
- Karmakar, M., Dey, P., & Roy, M. (2020). RISE OF SEA LEVEL AND THE SINKING ISLANDS OF SUNDARBAN REGION: A STUDY OF MOUSUNI ISLAND IN INDIA. *Journal of Global Resources*, 6(1), 233-237.
- Kontogeorgopoulos, N., Churyen, A., & Duangsaeng, V. (2015). Homestay Tourism and the Commercialization of the Rural Home in Thailand. *Asia Pacific Journal of Tourism Research*, 20(1), 29–50. <https://doi.org/10.1080/10941665.2013.852119>
- Kurttila, M., Pesonen, M., Kangas, J., & Kajanus, M. (2000). Utilizing the analytic hierarchy process (AHP) in SWOT analysis - a hybrid method and its application to a forest-certification case. *Forest Policy and Economics*, 1(1), 41-52. [https://doi.org/10.1016/S1389-9341\(99\)00004-0](https://doi.org/10.1016/S1389-9341(99)00004-0)
- Liu, A. (2006). Tourism in rural areas: Kedah, Malaysia. *Tourism Management*, 27, 878-889. <https://doi.org/10.1016/j.tourman.2005.05.007>
- Mukherjee, N., & Siddique, G. (2018). Climate change and vulnerability assessment in Mousuni Island: South 24 Parganas District. *Spatial Information Research*, 26, 163–174. <https://doi.org/10.1007/s41324-018-0168-0>
- Mulyono, S. E., Sutarto, J., Malik, A., & Loretha, A. F. (2020). Community Empowerment in Entrepreneurship Development Based On Local Potential. *International Journal of Innovation, Creativity and Change*, 11(2), 271-283.
- Oreski, D. (2012). Strategy development by using SWOT - AHP. *TEM Journal*, 1(4), 283-291.
- Rogerson, C.M., & Rogerson, J.M. (2020). CAMPING TOURISM: A REVIEW OF RECENT INTERNATIONAL SCHOLARSHIP. *GeoJournal of Tourism and Geosites*, 28(1), 349–359.
- Saaty, T.L. (2000). *Fundamentals of Decision Making and Priority Theory with the Analytic Hierarchy Process (Vol. VI of the AHP Series)*. RWS Publications: Pittsburgh. Available at: https://books.google.co.in/books?id=wct10TlbbIUC&source=gb_book_other_versions (Retrieved on 02.05.2023).
- Sahu, A.S. (2008). A STUDY OF CLASSIFICATION AND PERFORMANCE OF COASTAL STRUCTURES IN DIGHA PLANNING AREA, WEST BENGAL. *The Deccan Geographer*, 46(1), 59-74.

- Salam, M.A., Lindsay, G.R., & Beveridge, M.C.M. (2000). Eco-tourism to Protect the Reserve Mangrove Forest the Sundarbans and its Flora and Fauna. *Anatolia*, 11(1), 56-66. <https://doi.org/10.1080/13032917.2000.9686983>
- Shiri, N., & Saymohammadi, S. (2023). Feasibility Study of Tourism Entrepreneurship Development in Rural Areas of Darreh-Shahr County: Application of SWOT-AHP Model. *International Journal of Agricultural Management and Development*, 13(2), 151-166.
- Skrbic, I, Nesic, M., Miskovic, I, & Milosevic, S. (2019). PERCEPTION OF FACTORS OF ENTREPRENEURSHIP DEVELOPMENT IN VOJVODINA'S SUSTAINABLE TOURISM BY VARIOUS BUSINESS ACTORS. *Economics of Agriculture*, 66(4), 1143-1155.
- Sundar, V., & Sannasiraj, S.A. (2016). Shore protection for the coast of Mousuni Island in West Bengal, India. *International Journal of Ocean and Climate Systems*, 7(2), 35–46. <https://doi.org/10.1177/1759313116660563>
- Tisdell, C. (1997). Tourism Development in India and Bangladesh: General Issues, Illustrated by Ecotourism in the Sunderbans. *Tourism Recreation Research*, 22(1), 26–33. <https://doi.org/10.1080/02508281.1997.11014783>
- UNEP, & WTO. (2005). *MAKING TOURISM MORE SUSTAINABLE: A Guide for Policy Makers*. United Nations Environment Programme & World Tourism Organization. Available at: <https://wedocs.unep.org/20.500.11822/8741> (Retrieved on 02.05.2023).
- Weaver, D. (2002). Asian ecotourism: Patterns and themes. *Tourism Geographies*, 4(2), 153–172. <https://doi.org/10.1080/14616680210124936>
- Wickramasinghe, V., & Takano, S. (2009). Application of Combined SWOT and Analytic Hierarchy Process (AHP) for Tourism Revival Strategic Marketing Planning: A Case of Sri Lanka Tourism. *Proceedings of the Eastern Asia Society for Transportation Studies*, 7. <https://doi.org/10.11175/eastpro.2009.0.189.0>