Sustainable tourism development in Bangladesh: Challenges and opportunities to promote the Sundarbans

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Abstract
Purpose: The main objective of this study is to determine what needs to be managed and what obstacles make this World Heritage Site more attractive to tourists through sustainable development.
Research Methodology: The study was mainly quantitative in nature. To acquire primary data, the upazilas of Koira and Dumuria in the Khulna district, as well as Shyamnagar, Debhata, and Tala in the Satkhira district, were conveniently sampled because a sizable portion of Sundarbans are located there. A total of 365 individuals from five preselected locations completed a standardized questionnaire to provide information, and respondents were selected using a simple random sampling procedure. Statistics, such as frequency and percentage, and the logistic regression (LR) model were used to examine the data.
Results: Among the independent variables included in the NES framework, only eight variables—advantages of natural diversity, natural complications, compatibility, multi-culture opportunity, diversity of life, job opportunity, GDP contribution, and income opportunity—significantly influenced the sustainable development of tourism in the Sundarbans area.
Limitations: This research is based on the selected sample about the sustainability, protection, and promotion of Sundarbans, but most of the respondents had limited ideas about these key issues.
Contributions: If a sustainable communication system and a standard resort or hotel-motel are built, domestic and foreign tourists will be interested. Additionally, specific policies and adequate security arrangements should be implemented. Above all, the concerned ministries of the government should come forward to create awareness among the people living in the Sundarban area to protect the natural diversity of the region.
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1. Introduction
One of the biggest sectors in the world is travel and tourism. The tourism sector will contribute 7.6% to global GDP in 2022, up to 22% from 2021. In 2022, the tourism industry's contribution to the GDP of Bangladesh was 3.02%, which is 0.88% higher than that in 2021, and 8.07% of total employment is generated in this sector (Bangladesh Tourism Board Annual Report, 2020). However, it is a fact that sustainable development affects the socio-economic development of tourism, which is very different

from one place to another, from one community to another, and creates serious challenges in achieving a balanced environment (Sharpley & Telfer, 2014).

Sustainable development is a prerequisite of the tourism industry. Sustainable tourism helps preserve the natural balance, generates jobs, and sparks interest in the culture of local communities. It promotes ecological harmony, ecotourism, community interactions, and empowerment. This can promote cultural diversity and resource conservation for the benefit of humankind (Khalid et al., 2019). Since its inception, sustainable tourism development has seen many expectations and occasional ups and downs. Difficulties in acceptance and execution may be the cause. Sustainable tourism development, on the other hand, emphasizes the improvement of biodiversity, green tourism, the safety of environmental assets, and natural balance, and is, therefore, a growth of local preservation. Benefits humans, nature, and resource conservation (Stronza, Hunt, & Fitzgerald, 2019). Other sustainable tourism ideas are more precisely referred to as "cultural tourism," which unites travel with cultural components. More cultural variety helps people and diverse local groups to develop unique cultural identities. Local areas' crucial cultural identities and values can be explored for historical and productive insights through tourism-related activities (Du Cros & McKercher, 2020). It highlights certain particular possibilities and problems pertaining to management goals, and is an emerging topic. By learning everything about cultural tourism, both aspects may be grasped more clearly. The idea of maintaining the natural heritage of local and developing communities is present in both types of tourism.

It focuses on the elements of tourism, such as the natural context, socio-economic context, and contribution of the people of the region to the GDB of the country who live in this area. There are several inherent challenges in promoting and protecting the sustainable development of the Sundarban region. Sustainable tourism may also create opportunities for employment, health promotion, and educational recreation to strengthen local cultures (Yfantidou & Matarazzo, 2017). Increasing employment possibilities through sustainable tourist participation can improve income distribution and create suitable infrastructure for local communities to support their regional economies (Yogi, 2010). As a result, initiatives such as societal capacity-building are required for local cultures. These community problems were addressed. Lack of community involvement and integration in the development of sustainable tourism is a challenge (Kala & Bagri, 2018). Exploring the variables that can cause participants' lower involvement may be aided by addressing these difficulties. Following these difficulties, the chances of a sustainable development idea become complicated. To provide evidence-based support for future implications, this research dimension must be used to expose society's resistance and impediments to the introduction of new ideals. In order to help communities enhance their cultural and economic values, the socio-cultural and economic context of the tourism strategy is highly important (Chan, Marzuki, & Mohtar, 2021; Metsähallitus, n.d). On the other hand, sustainable tourism is projected to emerge in this area, providing practical means and opportunities to alleviate deprivations; therefore, all such beneficial qualities can only be explored and utilized in the Sundarbans area. However, most Sundarban regions do not benefit from tourism. They frequently voiced unfavorable opinions about tourism; therefore, local communities may face difficulties as well as the possibility of adjusting to industry.

2. Literature review

Sustainable development and sustainability have many definitions. According to the World Commission on Environmental Development (UN, 1987), the most commonly used definition of sustainable development is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." This notion indicates relationships among social equality, environmental preservation, and economic development, with each supporting the other. The World Tourism Organization (WTO, n.d.) has provided the following definition of sustainable development:

The demands of current visitors and host communities are met via sustainable tourism development, which safeguards and expands prospects for the future. It is intended to result in the management of all

resources in a way that satisfies economic, social, and aesthetic requirements, while preserving cultural integrity, crucial ecological processes, biological variety, and life support systems.

Criteria and indicators According to the Global Sustainability Tourism Council (GSTC), a tourism site, hotel, or tour operator can be evaluated based on four criteria to determine whether sustainable tourism development has been implemented. The four pillars of sustainable destinations are as follows: a) exemplify sustainable destination management; b) maximize economic advantages to the host community and minimize adverse effects; c) maximize benefits to communities, tourists, and culture; and d) maximize benefits to the environment. An international organization that offers advice for the creation and maintenance of sustainability standards for all sectors, the ISEAL Alliance standard code, and the ISO code of ethics, has been considered when designing the criterion development process (GSTC, n.d.).

Sustainable tourism development has gained virtually universal acceptance over the past 20 years as a desirable and politically correct strategy for tourist development (Sharpley, 2003; Vitrianto et al., 2021). 'Clean green' tourism, which implies businesses should aim to lessen the environmental implications of their operations, should be promoted within the tourism sector. The behavior of a destination's component businesses must be consistent with and supportive of this goal if it is to experience sustainable tourist development. Tourism businesses should adopt a Triple Bottom Line (TBL) approach to sustainable development, according to the research by Dwyer et al.. This will help guarantee that enterprises include social, environmental, and economic information in their management decision-making. If the destination as a whole is to adhere to sustainability standards, businesses must strive to achieve sustainability in their operations (Dwyer, Edwards, Mistilis, Roman, & Scott, 2009).

According to Lu and Nepal (2009), "green tourism" refers to travel that addresses environmental concerns. According to a study conducted in 2018 (Lenzen et al., 2018), tourism is responsible for 8% of the global carbon dioxide emissions. Consequently, the issue of sustainable tourism is of utmost importance. As a result, various future standards for sustainable tourism were produced, offering key environmental indicators for the tourist sector, such as reducing pollution, using renewable energy sources, and disposing trash. (UNEP, 2004; UNWTO, 2017; WTO, 2004, 2013). Innovation, research, and technical advancement, as noted previously, can offer major answers to address the environmental concerns of tourist growth.

The sustainable development pattern of the tourism industry is shifting for several reasons. Changes in the social, cultural, and environmental environments include these elements (George, 2021). These variables affect the essential materials needed to guarantee sustainability in tourist practices (Rodríguez Díaz & Espino Rodriguez, 2016). One of the elements is the socioeconomic aspect, which includes local involvement, support, awareness, access, and resources. Impacting the tourism industry's capacity to sustain the local environment (Vu, Tran, Nguyen, & Nguyen, 2020). Any negative aspect of these variables has the potential to disrupt society, the economy, and local areas. Social impact and structure are important factors, particularly in terms of tourist activities (Verhulst & Lambrechts, 2015).

The local communities are given many chances by sustainable tourism, but it also presents many difficulties (Aslam, Awang, & Samdin, 2012; da Conceição Walkowski, dos Santos Pires, & Tricárico, 2019). Sustainable tourism aims to improve and protect popular tourist destinations. However, sustainable tourism in rural regions implies a fashion-driven sector, necessitating a change in the role of rural areas as leisure destinations.

This change poses difficulties by erasing the true character of rural regions, upsetting their cultural surroundings, and heightening their anxiety. The justification for this is that because people in rural areas are less skilled at utilizing cutting-edge tactics to attract tourists, intermediaries are more likely to use tourism for their own financial gain than for the good of the local community, which creates difficulties for the locals (Aslam et al., 2012; Lichauco, 2022).

The important research findings from the literature that are pertinent to the promoters and challenges of developing sustainable tourism are the foundation for the current debate in this context. The primary possibilities and difficulties are outlined in the study of already published pertinent literature, along with product information for regional populations.

The literature on the chances and difficulties the Sundarban region faces in the tourist sector, however, is limited. This study fills that knowledge vacuum and offers pertinent data that will aid decision makers in developing remedies and modifying public attitudes. The study goal establishes a framework for the research process and is dependent on the information and research gaps that must be considered in research projects.

2.1. Purpose of the Study
Sustainable tourism is a necessary and timely step for the country to preserve the income, employment, and local ecosystem of the people living there, while keeping the natural environment and local culture unchanged. By doing so, the positive impact of tourism on biodiversity will be maximized through sustainable tourism development in the region; similarly, poverty will be reduced and a common goal towards sustainable development will be achieved. In addition, sustainable tourism can be a key vehicle for raising awareness and transforming positive attitudes to preserve biodiversity among millions of people who travel to Sundarbans every year. The purpose of this study is to find nature-based tourist spots in Sundarbans and to protect and enrich them through sustainable tourism development. This study includes two general research questions that mark the blueprint for this research.
1. What are the challenges faced by sustainable tourism development in Sundarbans?
2. What are the determinants of sustainable tourism development on Sundarbans?

2.2. Objectives of the study
The current study was conducted on 365 organizations, firms, tours, and travel agents located in and around Sundarbans with the following objectives:
1. To identify the challenges in the development of sustainable tourism in Sundarbans.
2. To identify the significant factors for sustainable tourism development in the Sundarbans area

2.3. Hypothesis
The hypothetical model proposed by the authors (Fig. 1) included three latent characteristics concerning tourism and sustainable development in the Sundarban region. Additionally, it has eight route hypotheses that describe the connections between three latent constructs: the natural context, sociocultural context, and economic context for the sustainable growth of tourism in the Sundarban region. Each path illustrates a potential relationship with either a positive or negative direction of influence.
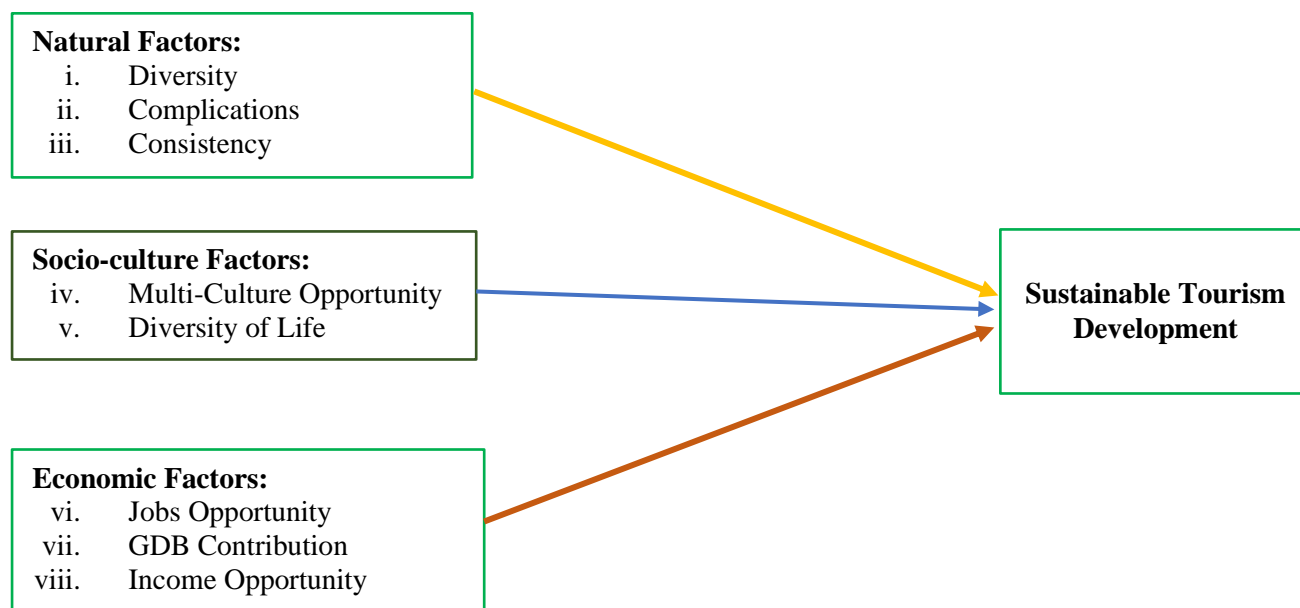
Figure 1: Relationships between sustainable tourism development in Sundarbans area and three Influential factors

2.4. Limitations of the study

Data collection was very time-consuming for the sustainability of the Sundarbans. Most respondents were reluctant to provide information because of their business. This research is based on the selected sample about the sustainability, protection, and promotion of Sundarbans, but most of the respondents had limited ideas about these key issues. Therefore, future research should be conducted based on a larger sample size regarding the sustainability issues of Sundarbans.

3. Research Methodology

This study was mainly quantitative in nature. Data for this study were collected from Sundarban areas in Bangladesh through a field survey. Khulna (Koira and Dumuria upazilas) and Satkhira (Shyamnagar, Debhata, and Tala) districts were selected for field surveys. These two districts were selected using a convenience sampling method from among the five surrounding districts of the Sundarban region because a sizable portion of Sundarbans is located there. A total of 365 people from five districts around Sundarbans (these five districts were selected based on the presence of tourists) were selected using a simple random sampling method, and their opinions were collected from respondents through a structural questionnaire.

A structured questionnaire was prepared to collect primary data from the respondents. Secondary information was collected from different sources such as books, journals, articles, newspapers, BTB, BPC, and related websites. The survey questionnaire comprised three major sections: economic, natural, and sociocultural factors. A five-point Likert scale and multiple-choice questions were developed for this study, maintaining conformity with the statistical methods and principles. The respondents were encouraged to talk freely and frankly about their opinions and suggestions about sustainable tourism development in Bangladesh: a challenge to protect and promote Sundarbans and its various functions.

Table 1. Frequency Distribution of sample Allocation by category of the Respondents

Category	Frequency	Percentage
Self-employed	54	14.8%
Seasonal Worker	74	20.3%
NGO Worker	10	2.7%
Day labor	13	3.6%

Tour operators	28	7.7%
Tour guide	46	12.6%
Tourists	140	38.4%
Total	**365**	

4. Results and discussions

4.1. Challenges Faced by Sustainable Tourism Development.

Of the six challenges detected as being faced by Sundarbans, with a view to sustainable tourism development.

Table 2. Distribution of Challenges Face by Sustainable Tourism Development

Challenges	Frequency	Percentage
Preservation of natural / cultural heritage	119	32.6%
Addressing the impact of tourism transport and Hotel management	64	17.5%
Lack of Information	28	7.7%
The surrounding public life and their culture are under threat	72	19.7%
Lack of Security	21	5.8%
maximizing natural resource use and production of waste	61	16.7%
Total	**365**	

According to Table 2, 32.6% of respondents think that the preservation of natural and cultural heritage is a big obstacle or challenge to sustainable development in the Sundarban area, which is the highest percentage in this category. On the other hand, the surrounding public life and culture are threatened, with 19.7% of respondents citing problems, which is the second highest percentage, while identifying the effects of tourism transport and hotel management (17.5%), maximizing the use of natural resources and waste production (16.7%), lack of information (7.7%), and lack of security (5.8%).

4.2. Demographic Profile

The researchers received 365 of the 365 questionnaires intended to be given to the respondents; no questionnaires were destroyed in the process. The response rate was 100%, allowing proper evaluation of the 365 surveys. A summary of the respondents' characteristics based on gender, age, and most recent educational background may be acquired from the results of filling out responses from the returned questionnaires.

Table 3. Frequency Distribution of Respondents Demographics Characteristics

Respondent's Demographics profile	Sustainable Tourism		Non-Sustainable Tourism	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Gender				
Male	192	67%	52	66%
Female	95	33%	26	34%
Age of Respondents				
Less Than 20 Years	102	36%	38	48%
20-25 Years	93	32%	26	34%
25-30 Years	50	17%	8	11%

30-35 Years	28	10%	3	4%
35-40 Years	8	3%	0	0%
40-45 Years	5	2%	1	2%
Above 45 Years	1	0%	1	2%
Education Qualifications				
SSC (Secondary)	03	01%	0	00%
HSC (Higher Secondary Certificate)	46	16%	13	16%
Graduation Qualification	135	47%	33	43%
Post-Graduation Qualification	104	36%	32	41%
Total	**287**		**78**	

In terms of gender, the majority of the respondents were male (67%). In contrast, 23% of the respondents were women. The survey data clearly show that women are underrepresented compared with their male counterparts. This may be due to the distinctiveness of the cultural environment in Bangladesh as well as the culture related to women's thinking in the workplace. It is true that only a few women entrepreneurs have chosen this sector. Moreover, women's participation in the tourism sector in Bangladesh has increased daily through new policies and support programs.

In terms of age group, the results show that informants aged less than 20 years comprised the absolute best quantity of all respondents (36%), and those aged 20–25 years were the second-highest age group (32%). In contrast, the other five groups represented more than 32% of the sample.

Regarding educational qualifications, the information shows that the graduation qualification degree of the sample was normally high. Approximately 47% of the informants' highest educational degree was at the graduation level, which was similar to the percentage of respondents with a post-graduation degree qualification as their highest qualification (36%). Sixteen% of the respondents held higher secondary certificate qualifications, and 1.0 those had secondary qualifications. The last part of the questions in the preliminary part of the survey addressed variables related to sustainable tourism development. Of the 365 responses, 287 were adopters (78.6%) and 78 were non-adopters (21.4%).

Table 4. Distribution of Sustainable Tourism Development Status

Sustainable Tourism Status	Frequency	Percentage
Yes	287	78.6%
No	78	21.4%
Total	365	

This might also suggest a moderately true level of consciousness among sustainable tourists about the function of tourism development and its impact on its nature, economy, and socio-culture.

4.3. Reliability & Validity
4.3.1. Reliability
Table 5 shows that the Cronbach's alpha coefficient scores of the three stated factors (eight variables) are between 0.708 and 0.910. This proves that the internal consistency and reliability are good.

Table 5. Reliability Assessment Summary

Corresponding Survey Question No.	Factors	Score of Reliability (**Cronbach's alpha**)

	Natural Factor	
Q17-Q19	Advantages of natural diversity	0.708
Q20-Q21	Natural complications	0.825
Q22-Q23	Compatibility	0.910
	Economic Factor	
Q24-Q25	Multi-Culture Opportunity	0.712
Q26-Q27	Diversity of Life	0.867
	Socio-culture Factor	
Q28-Q29	Jobs Opportunity	0.819
Q30-Q31	GDB Contribution	0.788
Q32-Q33	Income Opportunity	0.868

4.3.2. Validity

The KMO Index and the BTS indicated that both values met the standard criteria. From Table 4, the values obtained from the three factors under the NES model are higher than the standard value of 0.6 on the KMO index. Again, the BTS index showed that the values obtained in the three contexts of the NES model were significant (P <0.05). The above two indicators (KMO and BTS) support the performance of FA on the data used in the research study.

Table 6. Value of KMO and BTS in NES context

Factor	Measure	
	Kaiser-Meyer-Olkin (KMO)	**Bartlett's Test of Sphericity (BTS)**
Natural Factor	0.799	1745.3 (p = 0.00, <0.05)
Economic Factor	0.862	562.02 (p = 0.00, <0.05)
Socio-culture Factor	0.727	2001.2 (p = 0.00, <0.05)

The factor loading and cross-loading figures in the NES context (natural, socioeconomic, and economic factors) in this study are more than 0.5, which indicates the ideal value of the adopted situation.

4.3.2. Logistic Regression (LR)

After considering the objectives of the current study and the nature of the predicted variable, which is dichotomous/binary (encrypted as 1= sustainable tourism development and 0 = non-sustainable tourism development), LR analysis has been adopted as an appropriate method to analyze the impact of NES context-related factors on the decision to undertake sustainable tourism development in the Sundarban areas.

A model is usually used to show the relationship among the set of variables in LR (logistic regression), which is represented and explained by a mathematical equation (Chatterjee & Hadi, 2015; Triola, 2008) as follows:

$$logit\ (Y) = b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + \cdots + b_n X_n$$

Where,
Y = Represent the predicted variable
$x_1, x_2, x_3 \ldots \ldots \ldots x_8$ are the independent variables; in the current study that symbolize the 8 NES context associated factors incorporate in the model.
$b_1, b_2, b_3 \ldots \ldots \ldots b_8$ are the coefficient of the independent variables incorporate in the model

Determining the effect of every independent variable in relation to the regression mannequin outcomes involves determining the most dominant variables. In summary, finding independent variables

throughout the construction of logistic regression (LR) models can be vital, even though it is not a convenient result (Keller et al., 2004; Zhang et al., 2015).

However, a binary LR was used to identify the factors (the independent variable) that have an impact on the adoption of sustainable tourism in Sundarban areas (the dependent variable). Therefore, based on the findings associated with every independent variable concerned in the evaluation as well as explicating the contribution of all model outcomes by calculating the influence of changes on every single independent variable to understand the eight NSE variables through hypothesis testing, the outcomes of the logistic regression (LR) analysis show that four factors were supported and dictated to have a tremendous effect on the adoption of sustainable tourism development in Sundarbans. In this regression model, all eight variables were included.

Table 7. Outcomes of Logistic Regression Analysis

Independent Variables	B	S.E	Wald	D.F	Sig.	Exp (β)
Natural Factor						
Advantages of natural diversity	0.21	0.37	4.19	1.00	0.04	1.25
Natural complications	0.56	0.28	3.42	1.00	0.03	1.89
Consistency in Nature	-0.97	0.56	4.12	1.00	0.01	0.60
Socio-culture Factor						
Multi-Culture Opportunity	-0.11	0.41	7.03	1.00	0.03	1.46
Diversity of Life	1.09	0.56	9.01	1.00	0.04	3.61
Economical Factor						
Jobs Opportunity	-0.21	0.19	0.31	1.00	0.04	0.78
GDB Contribution	0.03	0.12	0.04	1.00	0.02	2.29
Income Opportunity	-0.13	0.24	0.11	1.00	0.01	1.06
Constant	-1.52	1.21	11.23	1.00	0.04	1.60

Hosmer & Lemeshow = 12.419, Snell & Cox = 0.356, Nagelkerke = 0.267 Significance: * p < 0.01, ** p < 0.05, *Predictor variable: 0 = No, 1 = Yes

From Table 7, all NES context variables were found to have a noteworthy contribution to the research model. The NES context-related findings are discussed in more detail in the following paragraphs.

4.3.3. Natural Context:
As previously pointed out, natural attributes such as advantages of natural diversity, natural complications, and consistency in nature were incorporated in the logistic regression (LR) analysis to determine the factors that influence the development of sustainable tourism in Sundarbans. Table 8 presents the hypotheses related to the factors tested in relation to the natural context.

Table 8. Natural Context Related Hypothesis

No.	Hypothesis
H1	Sustainable tourism development in the Sundarbans area positively affects the increased advantages of natural diversity
H2	The development of sustainable tourism in the Sundarbans will reduce the perceived natural complications and indicate positive impact.

H3	The development of sustainable tourism in the Sundarbans will reduce the perceived consistency in nature and have a positive impact.

The three variables tested, including advantages of natural diversity, natural complications, and consistency in nature, were found to be significantly related to sustainable tourism development in the Sundarban area, as each showed a p-value of less than 0.05. Within the natural factor milieu, the important variables are as follows: The outcome of the advantages of natural diversity suggests that the figure is statistically significant at the level of 0.05 ($\beta = 0.21$, $P = 0.04$, <0.05). From the outcome, the factor advantages of natural diversity play a significant role in the decision of sustainable tourism development in Sundarbans, as well as its accepted hypothesis (H1). After receiving support from the result of the positive effect of natural complications ($\beta = 0.56$, $p = 0.03$, <0.05) on the prediction of sustainable tourism development in Sundarbans, the related hypothesis (H2) was accepted.

Further consistency in nature ($\beta = -0.97$, $P = 0.01$, <0.05) was found to adversely affect SMEs' decisions to accept social media. Consequently, it exaggerated itself to accept the hypothesis (H3). Another natural factor (compatibility) significantly influences the development of sustainable tourism in Sundarbans.

4.3.4. Socio-culture context
The results of two variables, multicultural opportunity and diversity of life, are attempted to explicate the socio-cultural context. Table 09 explores the hypotheses linked to these two factors. All organizational context variables were found to have an important effect on the development of sustainable tourism in Sundarbans, according to the outcome of the logistic regression (LR) analysis. The relationship between each of the two variables within the socio-cultural context according to the findings is presented here.

Table 9. Socio-culture Context Related Hypothesis

No.	Hypothesis
H4	Sustainable tourism development has a positive impact on multi-culture opportunity in the Sundarbans area.
H5	Sustainable tourism development has a positive impact on diversity of life in the Sundarbans area.

From the results, the multi-cultural opportunity variable indicates that it is statistically significant at the 5% level of significance ($\beta = -0.11$, $p = 0.03$, <0.05), and that the effect of the multi-cultural opportunity variable is negative on the anticipation of sustainable tourism development in Sundarbans, and its related hypothesis (H4) has been accepted. The results for diversity of life indicate that it is statistically significant at the level of 0.05 ($\beta = 1.09$, $p = 0.04$, <0.05). According to the outcomes, Hypothesis (H5) was adopted, which signifies that diversity of life plays a significant role in the development of sustainable tourism in Sundarbans.

4.3.5. Economic Context:
The LR model was applied in this study to verify whether there is any effect of the three variables (job opportunities, GDP contribution, and income opportunities) within the economic factors on sustainable tourism development in the Sundarban region. Table 10 presents the hypotheses associated with the economic factors. In this study, the three variables within the economic factors for sustainable tourism development in the Sundarbans region have been proven to be statistically significant.

Table 10. Economic Related Hypothesis

SL	Research Hypothesis
H6	Sustainable tourism development has a positive impact on job creation in the Sundarbans area .

| **H7** | Sustainable tourism development in the Sundarbans has a positive impact on contribution to GDP. |
| **H8** | Sustainable tourism development in the Sundarbans has a positive impact on income opportunities. |

The results of the above table show that there is a significant correlation between job opportunities, GDP contribution, and income opportunities in order to develop sustainable tourism in Sundarbans. The value of p was less than 0.05. In the context of economic factors, each important variable is represented as follows. The results of job opportunities in sustainable tourism development in Sundarbans indicate that at the level of 0.05, it is significant ($\beta = -0.21$, $p = 0.04$, <0.05). From the outcome, the component job opportunities play a vital role in the decision to develop sustainable tourism in Sundarbans, and its related hypothesis (H6) was accepted.

GDP contributions and income opportunities recommend that they be significantly statistically fit at the level of 0.05 ($\beta = 0.03$, $p = 0.02$, <0.05, and $\beta = -0.13$, $p = 0.01$, <0.05). The results show that GDP and income opportunities play an important role in sustainable tourism development in Sundarbans, as well as its related hypotheses (H7 and H8).

5. Conclusion
The goal of this study is to examine the challenges facing the protection and promotion of Sundarbans' sustainable development. According to a preliminary examination of the literature, the development of eco-friendly and green tourist destinations may be achieved through sustainable growth in the tourism industry. The development of sustainable tourism in a specific region benefits the growth and empowerment of local residents. The Sundarban region and its local populations, as well as the expanding tourism industry in the nation, would benefit from initiatives performed in the name of sustainable development.

The analysis of the figures reveals various types of sustainable tourism, including natural factors, which emphasize the persistence of diversity, complications, and consistency; the socio-cultural factor, which emphasizes the cultural practices of the local communities, resulting in greater gains and advantages for the local communities; and the economic factor, which emphasizes the growth of economic activities through the development of sustainable tourism in the regions.

The papers were used to examine the difficulties in preserving and advancing environmentally responsible tourism in the Sundarban region. In conclusion, it was discovered that sustainable tourist development favorably affects the economic success of local communities. The increasing number of visitors visiting rural areas has socioeconomically benefitted locals.

It is made easier in terms of employment and job creation, as well as the growth of small enterprises, all of which eventually help citizens of underprivileged local areas and the GDB of the nation. Additionally, sustainable tourism offers the chance to advance sociocultural; as a result, there are more opportunities for multiculturalism and greater variety in the local communities.

Local communities are also strengthened by more active participation in tourism-related activities. Sustainable tourism development is characterized by a number of obstacles in addition to these possibilities. This study identified three problems in the field of sustainable tourism development in the Sundarbans region: lack of security, lack of scientific knowledge of the conservation of natural and cultural resources, and lack of local knowledge of sustainable development. Therefore, to build sustainable tourism in these areas, proper thought-out methods are required.

5.1. Recommendations
Sustainable tourism development is a great concern in the present-day context because such activities can protect and preserve biodiversity, culture, and the environment from adverse impacts on

Sundarbans. To establish sustainability in Sundarbans, key stakeholders (local people, government, tourism experts, tourism entrepreneurs, tour operators, NGOs, researchers, environmentalists, human rights workers, media, visitors, etc.) have to work collectively and jointly to contribute to the social, cultural, and economic development of the country. Engine boats should be avoided while visiting tiny rivers to watch birds, because the sound from the engine boat may disturb animals and birds. Therefore, there should be a developed, environment-friendly boat for a safe journey on Sundarbans to watch river trails.

Popular tourist destinations such as jungle boating, jungle river cruising, flora, fauna, wild animals, birds, ecology, forest trial opportunities, sandy beaches (Kotka), and cultural diversity (village people, traditions, customs, lifestyle, accommodation) should be protected and preserved to ensure the sustainability of Sundarbans (the world's Largest Mangrove Forest) as a promising tourist destination (Amin, 2018; Gunasekara & Silva, 2021; Islam, 2016; Rahman, 2010). In addition, the habit of throwing waste into rivers and inside the jungle (sundarbans) should be changed, keeping in mind the biodiversity of the area. Thus, an increasing number of watching towers must be established for visitors. Moreover, a monitoring medical team may assist these patients if any tourist or visitor feels sick while visiting Sundarbans.

For ecosystem protection, the interests of the local people must be involved in the planning and sustainable development of the Sundarban region. To ensure continuous monitoring and evaluation, there should be joint management and collaboration between the forest, tourism industry, local government, host community (village people), and other stakeholders. Furthermore, there must be an information portal based on the websites of Sundarbans about the tourist destinations, forest trails, jungle boating, and guidelines on what to do and not to do. Moreover, to promote Sundarbans, environmental awareness, wildlife videos, and published photographs of Sundarbans in different media must be included. All of these suggestions can be considered as principles and guidelines for sustainable tourism development in Sundarbans. Since Sundarbans spread across Bangladesh and India, collaboration between Bangladesh and India is important for promoting sustainable tourism development in the entire region.

Acknowledgement

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