

Responsible Beach Tourism & Environmental Issues in Sustainable Development: A Study of Digha, West Bengal, India

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Abstract

Sea beaches have always been a major attraction for people. Human beings have always been fascinated by the oceans and it has attracted people from far and near and this has been a constant phenomenon not just in India but globally. Sustainable Tourism is the only way to protect the coastline and the future tourism business. The direct involvement of Government and locals for creating public awareness regarding the consequences of environmental degradation might be a welcome step to achieve this goal. This study explores the environmental impact and also to understand the various impacts of tourism analysis of the area. This study would promote a better sustainable ecotourism practice and help in making Digha a sustainable destination. Digha, which is the marine aquarium and a coastal resort town, is having all of the fundamentals; nearly over a 5 million of tourist visits every year. Nothing but the development of sustainable eco-tourism is the only way to protect the coastline and tourism business. The direct involvement of government and locals for creating public awareness regarding the brutal consequences of environmental degradation is necessary. This study explores the unplanned environmental impact in a very popular beach tourism destination, Digha in West Bengal, India. To understand the various impacts of tourism strategic analysis of the location has been performed. This study promotes a more sustainable ecotourism practice to promote tourism at Digha.

Keywords: Beach Tourism, Marine Aquarium, Eco-tourism, Responsible Tourism, Digha.

1. Introduction

Tourism is the only fastest growing industry in the world which provides both social and economic benefits for the nation. It has huge economic and potential development and also a tremendous source of employment generation. Since, the natural beauty is a first priority to the tourist in order to visit a destination; the Beach tourism getting its premium importance in the world. And the fact behind this is 20% of the earth's surface contains only coastlines and more than 70% of the countries and major cities are located around the beaches & coastlines. That is why this unique combination of both land and sea activities are making these areas very much attractive to all inbound and outbound visitors and tourists. (Mason, 2000)

The coastal belt of Digha and Mandarmani are such destinations where most of the domestic tourist visits during weekend. As the availability of the local transport and accommodation facilities are available at an affordable price; most of the domestic local tourists as well as other domestic tourists from different states frequently visit at Old Digha, New Digha or Mandarmani any time of the year. (Anandabaskaran & Vijayakumar, 2017) Of course due to the natural attraction of the coastal belt and moderate climate a footfall of tourist is always high but it is a challenge for the tourist and as well as for the hotel owners to accommodate number of rooms or desired accommodation to all visitors. (Baitalik & Majumdar, 2015)

But unfortunately, the unplanned growth of tourism, poor management and processes of the tourism business are continuously causing negative impact on each tourist destination. Extreme ecological & environmental changes are happening due to human intervention. These human activities are causing erosion, habitat loss, and damages of wetlands, water pollution and

endangering of the marine ecosystem as well. (Shamim M. R., 2020)

As beach and coastal areas are very much fragile and vulnerable the protection of coastal and beach regions is very much necessary in order to preserve natural beauty and ecosystem for the sake of long-term profitable tourism business and tourist footfalls. As the natural environment is the major ingredient of tourism industry; hence the proper balance must be created between the beach environment and tourism activities. It can be done more accurately through sustainable development. But to start the sustainable development it is necessary to have proper environmental protection and proper utilization of natural resources. (Roy M., 2020)

Since, Digha beach is very much popular among the locals & people from nearby cities in WB; huge human interference has intervened ecological balance. This study also clearly shows an impact of tourism on beach and coastal environment for Digha and also shows the way for sustainable development of eco-tourism practices. (Roy & Shamim, Research on the Impact of Industrial Pollution on River Ganga: A Review, 2020)

The authors have analyzed tourist responsible behaviour, socio-cultural and environmental diversity at Bangalore. Responsible behaviour of tourist also plays a major role in order to obtain sustainable development of a destination. (Sandilyan, Soonthodu, & Singh, 2022)

This case study promotes an observation and the effects of beach tourism on the environment. Digha beach town is one of the famous tourist destinations among the locals in WB, India. Digha has a beautiful natural wide coastline and a picturesque sea surface and obviously intoxicating rows of casuarinas and eucalyptus trees. The nearby mangroves, sand dunes and the nearby Sundarban delta are major attractions for visitors and it's a home for many inhabitants.

Aims and Objectives

- To identify the linkages between tourism pressure and tourist behavior
- To highlight the effects on coastal ecology and habitat.
- To promote sustainable development of Tourism at Digha.

2. Research Methodology

This research is based out of analysis of secondary data. For this work we have checked many of the relevant research journals, research articles, publications and also many newspapers articles and books. We have also gathered relevant primary data through questionnaires. We have shared the questionnaire with the local tour operators, Hotel owners and managers, reviews from the local tourist and local residents. Based on this questionnaire and findings we have prepared the report.

2.1 Overview of Digha & its Coast line

One of the famous tourism destination and flat coastline off Digha is one of the places of attractions for any domestic and international tourist in West Bengal. The local dunes, sea shore and picturesque greenery made it more attractive during autumn and winter vacations. The average temperature has made it more acceptable to all visitors. Nearly five million of tourists used to visit here in every year. Local facilities like business market, Hotel lodgings, recreation center are available which are very cost-effective and minimum of wages; which made it much more comfortable, convenient and a safe destination for West Bengal tourists.

2.2 Study Location

Digha is located in the district of East Midnapore in the state of West Bengal, India. The accurate geographical location ranges from 21°36'50" N, 87°29'E to 21°39'N, 87°37'E (Figure 1). The average elevation of 6m, Digha comes under the tropical climatic zone. As Köppen-Geiger has explained the climate classification, it is classified as in summer and winter the temperatures are 37°C and 24°C respectively. According to the locals and as per the weather report July to March is the best time for the visitor to visit Digha because during that time the average temperature in the car is 26.6°C. In extreme cases during monsoon Digha face high humidity with beat rainfall which is approximately 1519 mm (Figure 2).



Fig. 1: Location Map of the Study Area.

3. Literature review

3.1. Tourism and the environment

According to the researchers current tourist flow is essential to improve tourism business to those tourist destinations which is also helping hospitality and tourism sectors to improve sustainable development. To improve this sustainable growth, innovation of information technologies are playing a major in this filed. (Manes & Tchetchik, 2018)

According to the researchers point of view; continuous developing technologies & widespread of internet access has helped the tourist to make their own travel itineraries and hotel bookings. As a result of the same local hotels of those tourist destinations are getting maximum bookings and in maximum cases those destinations are crossing capacity of local and domestic tourists. (Reyes-Menendez, Saura, & Martinez-Navalon, 2019)

In the view of the COVID 19 situation, researchers have analyzed that it has helped the environment in worldwide. Environmental degradation like pollution, global warming, and climate change, change of ecosystem and even bio-diversity has came under control due to less human interventions at various tourist destinations. (Haleem, Javaid, & Vaishya, 2020)

Coastline and the beaches are one of the major natural assets for many countries that provides multiple tourist and recreational activities, source of earning to the local communities. But due to the irresponsible usage by the tourists & local communities, these coastlines are causing pollutions. During this pandemic state, as social distancing was in first priority; it caused reduction of garbage & waste generation. Less generation of garbage & waste also plays a positive impact on natural resources e.g. water, air, soil, etc. (Pandey, Mahadevan, & Joshi, 2021)

According to the researcher's analysis, due to COVID 19 restrictions, tourism economy has fallen drastically around the world. These decreases of tourist footfalls caused reduction of pollution which has reflected as a positive impact on tourism sustainability & resiliency of pre-exist socioeconomic structure & environmental issues on tourism. (Loannides & Gyimothy, 2020)

As researchers have explained in their studies on sustainable development; community awareness and local awareness are much important part for any destination development. Sensitivity-stability, maladaptive capacity-recovery, & transformation are major three components for sustainable development of a destination. (Tsao & Ni, 2015)

As the researchers have expressed their views on tourism development that improper development of without of caring the resilience of shoreline at Digha; increasing number of tourist flow is causing over population & beach pollution. Such uncontrolled beach activities contribute pollutants to the local habitants, estuaries & salt marches. (Taraferder & Jana, 2014)

In the view of sustainable development researchers have suggested for Eco-Tourism development instead of Mass Tourism. As they mentioned in their analysis, combination of environmental education in collaboration with local awareness may improve the hygiene standard of the coastline. Litter free beach always create aesthetic beauty of the coast line. (Mandal, Dandapath, & Sukla, 2013)

Costal tourism includes multiple recreational & Leisure activities which is formulated around the shorelines. As multiple tourist activities are happening; several factors are matter of concern for sustainable tourism development. Since the coastlines are one of the revenue generated tourist destination; negative environmental & socio-cultural effects are happening. (Drius, Bongiorno, Depellegrin, Menegon, Pugnetti, & Stifter, 2019)

Digha is commonly having flattened coastline including line of beach ridges, beach belts and obviously marine terraces. There are a few scattered acrolein dunes at low heights scattered in various region. The entire coastline can be divided into two parts based on the erosion and accretion, i.e., erosion regime and accretion regime respectively. The continuous deterioration of the environment and its natural resources is happening due to this unplanned tourism. This unplanned tourism has created a major damage in the whole Digha region. (Bera, 2015)The scope of study area is majorly done based on the large number of tourists who used to venture at Digha and New Digha. The most adverse effect of tourism on the Digha beach is mentioned in tabulated form in (Table 1).

Table 2: Environmental Impact of Tourism on Digha.

Place	Discovery	Impact of Tourism
Old Digha	Late1950s	Change in shoreline and water table flooding and inundation and anthropogenic pollution
New Digha	Mid1980s	Built up dune surface, wind erosion of sand dunes and anthropogenic pollution

Apart from that a questionnaire survey has been conducted among the tourist and the local Hotel owners; it is been found that most of the tourist is used to visit coastal region during the winters. Multiple modes of transportation services are available but the most comfortable and preferred mode of transport is by train; in case of road transport buses and other private vehicles are available for comfortable journey. Most tourist and travellers are having complaints regarding the poor waste management, pollution and damages around the places and specifically the environmental damages. The nearby accommodations near Digha beach, i.e., local hotels, residential houses, lodge and recreational centres are available starting from 20 to 30 rooms' properties. Tourists are also having the complaint regarding the scarcity of drinking water and also the necessary amount of water for daily use during their stay. (Yadav & Majumder, Diversity and distribution of seaweeds at Digha coast, West Bengal, India,2020)

Due to the development of tourism and transformation of destination many of the negative impact happens. As the destination is developing, the facilities are causing competition among the local businessmen. (Cohen, 1978) To improve the tourism services and the facilities of the destination congestion of traffic, environmental issues, noise and sound pollution, lack of power supply, damages to flora and fauna and scarcity of drinking water are very common. (Marzuki, 2009)

Table - 2 is the representation of "Environmental Impact of Tourism on Digha", which shows that during this last 30 years the growth of pollution and sand erosion has increased the level of sedimentation which also creating impact on rising of sea water level.

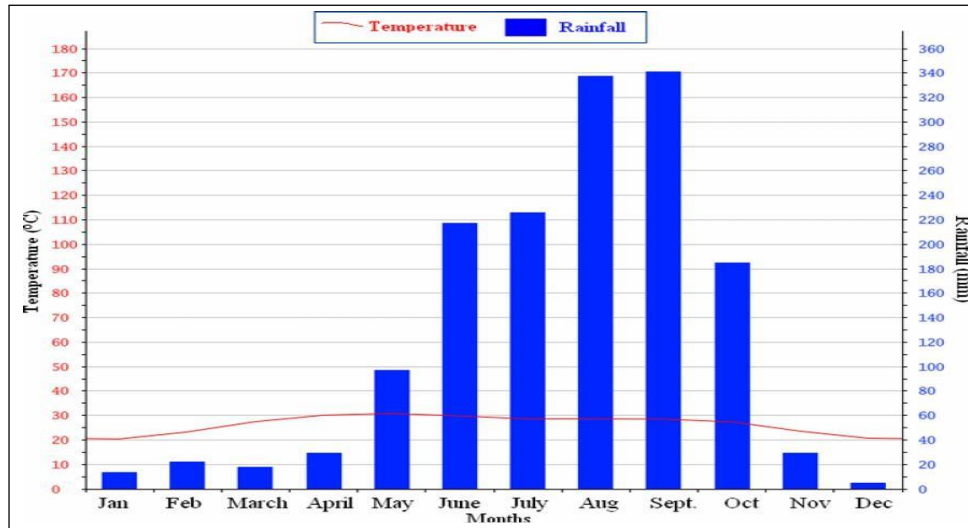


Fig. 2: Climate Graph of Digha.

Most of the places in Digha people are using boring method to fulfill the scarcity of water; creating huge impact on underground water supply.

Fig.2 represents that Digha region has average rainfall of 40 to 60 mm during the months of February till October. This figure also shows that it is the best time to visit the destination as temperature is also comfortable between 22°C to 28°C. The footfalls of tourist generally increase during July to September and may extend till the end of October.

3.2 Sea Level Rise and Erosion

Extreme sedimentation is happening from the coastline and the nearby areas as a result the suspended sedimentation which is gradually increasing & causing 3.14 mm/year the rise of sea water level. And this continuous rising of sea water level will cause the erosion around the shore line at Digha which may happen near about 17.5 m/year.

Besides that, continuous soil and water pollution which are caused by unhealthy and unpredictable use of sea shore area also the throwing of chemical waste and plastic garbage in the sea water. Material waste, poor drainage in surrounding areas specifically New Digha and old Digha town are causing enormous damages off the shoreline and causing danger to the Marine ecosystem. (Digha- Shankarpur Integrated Beachfront Area Development Plan, 2013)

3.3 Beach Pollution

As the local city has developed so the accommodation facilities specifically at New Digha; drainage waste from the local hotels, market and other surroundings have caused continuous deterioration factor of water. The abundance of installation for tube wells in every place specifically for dune bank and also excessive boring of groundwater by the local hotels and other recreation centres also causing the collapsing of subsoil layer. This will ultimately cause erosion scarcity of drinking water and seepage of saline water into the drinking water. (Vikas & Dwarakish, 2015) The flat sea-beach of Digha and other nearby places of Purba Medinipur already has become a popular destination and picnic spot due to natural attractions.

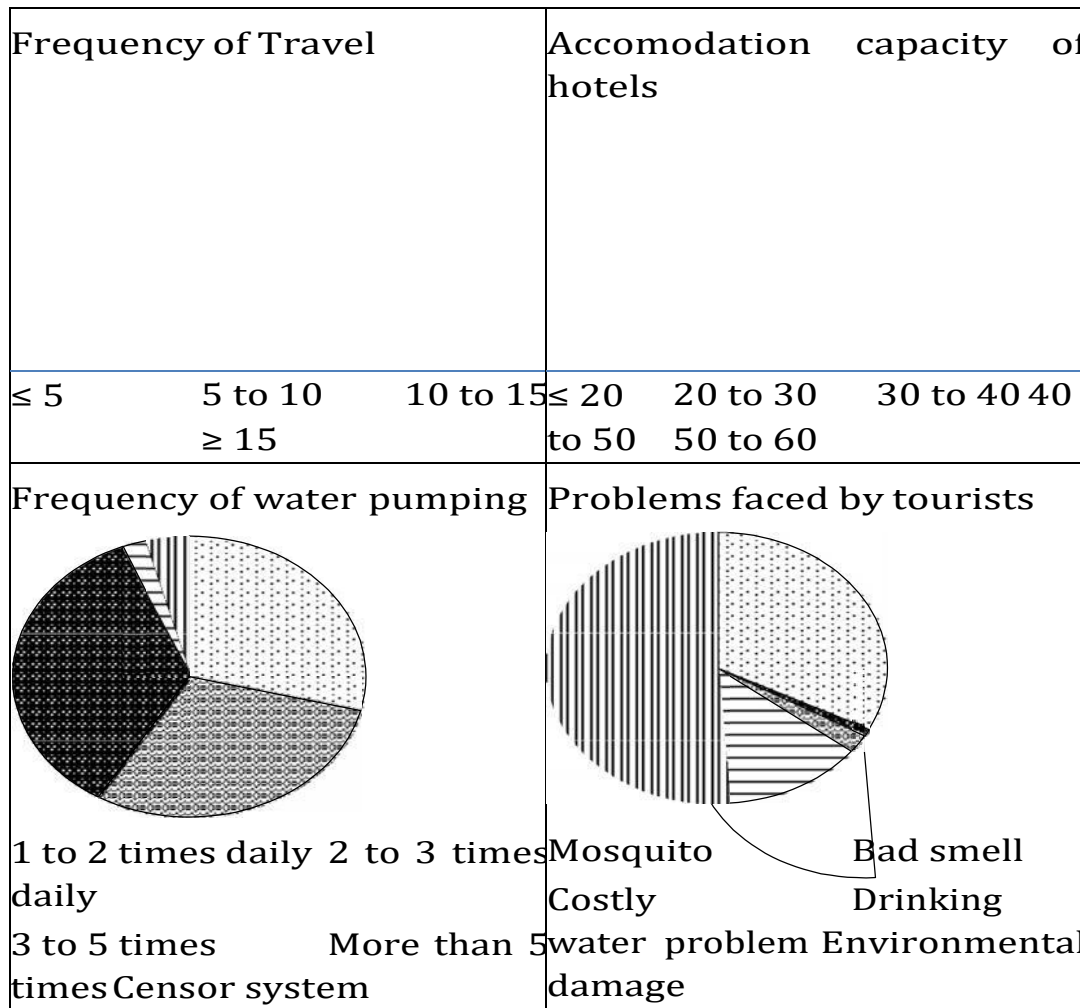


Fig. 3: Effect of Tourism on the Coastal Environment

To celebrate their fest people are using plastic or foam plates, plastic bottles, cups, thermo cols which they are throwing here and there around the beach areas which causing pollution. (Klein, Jeffrey, Osleeb, & Viola, 2004)

Fig. 3 signifies that what are the main constraints to the tourists who are coming to visit Digha. It also represents that capacity of accommodation facilities in Digha for different age group, water consumption ratios of the visitors and other parameters like surrounding issues, pest issues, and hygiene conditions of the areas are creating major impact on decreasing number of tourist and challenges for sustainable tourism development of the place.

According to the researchers opinion due to the growing pressure of tourism it is causing higher challenges on tourism and much chances of criticism about the destination. Although there is a limited percentage of people who are aware of the challenges about the impact of tourism, but a majority of tourist and local people are very much casual on environmental and coastline degradation. (Kotuwegoda, 2010)

3.4 Climate Change

If there are no proper balance between tourism activities and natural resources; it will definitely cause severe extreme weather condition like storm, draught and even epidemic diseases. That is why it is very much important to have a proper control over tourism business,

utilization of proper natural resources without hampering its actual form. It is always recommended that if the tour planning can be made in equal balance with the nature it will definitely going to benefits both the tourism sectors as well as the tourist. The increasing number of tourist flow in West Bengal is causing the pressure on coastal environment. (Chakraborty, 2010)

3.5 Industries and Tourism

The abundant growth of industries, offices, hotels and other recreational centers around the city and outskirts of the city seriously affects the environment and its actual forms. Continuous oil spills from the vessels, chemical waste from the factories, unplanned sewage and also day today huge waste disposals are causing brutal effect for the marine ecosystem and killing its inhabitants. The polyps and coral ridges are destroying day by day due to this poor tourism planning, urbanization, material waste and unawareness. (Ritchie & Crouch , 2000)

3.6 Financial Investments

Tourism is one of the fastest growing service industries which require huge investments. It generates millions of revenues. Tourism is the only industry which contributes towards the economic growth, cultural growth and community growth of a particular destination. It's directly and indirectly involved in employment generation and also provides fundraising for any tourism entrepreneur or tour operators. To make any certain tourism destination attractive; it really requires attention to detail in terms of making the tourism destination attractive and a safe place to visit. (Rahmani, 2007, pp. 24-31)

3.7 SWOT Analysis

To justify the tourism business and its advantages and disadvantages SWOT analysis is one of the effective tools to make it more effective and efficient. It is generally done based on the survey from local residents the local tourism business owners, Hotel managers, and tourism entrepreneurs and obviously the tourist and visitors through a questionnaire method. In the SWOT analysis the strength and opportunities are one of the positive factors which determine that what are the possibilities a tourism destination have and on the other side the weakness and threats generally indicates the negative factors of the tourism business. (Prideaux & Cooper, 2009)

The basic positive and negative result that emerged from the SWOT analysis has been explained and summaries in **Table 3**.

Table 3: Tourism and its Effects on Environments.

Basic Requirement and Industry Demand	Tourism Formulation	Effects on Environment
Water Pollution	Release of garbage and sewage, leaked oil from cruise ships	Contamination, health hazards, loss of aquatic plant and animals

Water Consumption	Excessive tourism pressure on particular seasons and withdrawal of huge amounts of groundwater	Depletion of ground waterresources
Transport	Increase in petrol and diesel driven transports	Air and noise pollution have adverse impact on flora and fauna
Hospitality and Accommodation	Violation of the Coastal Regulation Zone(CRZ)notification of 1991, cutting of huge number of trees, Destruction of shifting dunes for expansion and construction of resorts, hotels, shops etc.	Loss of forest displacement of people traffic congestion, land use change and pollution

Table 3 represents, constant release of garbage, leakage of oil and spillage causing water contamination and killing the marine flora and fauna. Excessive pressure by boring groundwater is causing lack of water supplying around the places. High congestion traffic leads to noise pollution and increasing carbon footprint in the local area. Growth of hospitality and recreation centers is causing deforestation, pollution, traffic congestion and sedimentation as well.

Table 4: SWOT Analysis

Strength	Weakness	Opportunity	Threat
1.Popularity	1.Unsustainable recreational facilities	1.Locational advantage	1.Coastal erosion
2. Standard of living has increased	2. Unsustainable waste management system	2.Availability of unexplored virgin beaches	2.Natural habitat loss
3. Higher tourists' arrival	3. Unplanned development hotels and shops	3.Potentiality to introduce ecotourism	3. Loss of bio-diversity
4. Increase in transportation facilities	4.Tourism has increased crime rates	4. Funds generated from tourism activities can be used to promote better infrastructure	4.Land degradation
5. Tourism has encouraged variety of cultural activities	5. Tourism has changed traditional culture	5. Employment opportunities have increased	5. Depletion of water resources
6. Tourism has increased the level of awareness	6.Overcrowded beaches	6.Economic development	6.Pollution

4. Analysis of Data

Table 4.1 Case Processing Summary

		N	%
Cases	Valid	104	100.0
	Excluded ^a	0	.0
	Total	104	100.0

a. List wise deletion based on all variables in the procedure.

Table 4.2 Reliability Statistics

Cronbach's Alpha	N of Items
.706	21

From table 4.1 and 4.2 we can see that the reliability for internal consistency of the data is 0.7 (Cronbach's Alpha) and is acceptable. (Field, 2019) Hence the data is found fit for further analysis.

Table 4.3 Correlations

		Score of Destination	AVG_ScIT	AVG_ScDOTh	AVG_ScDOL
Score of Destination	Pearson Correlation Sig. (2-tailed) N	1 104	.667** .001 20	.836** .000 47	.808** .000 37
AVG_ScIT	Pearson Correlation Sig. (2-tailed) N	.667** .001 20	1 20	.836** .000 47	.808** .000 37
AVG_ScDOTh	Pearson Correlation Sig. (2-tailed) N	.836** .000 47	.836** .000 47	1 47	.808** .000 37
AVG_ScDOL	Pearson Correlation Sig. (2-tailed) N	.808** .000 37	.808** .000 37	.808** .000 37	1 37

** . Correlation is significant at the 0.01 level (2-tailed).

From Table 4.3 we can see that there is strong positive correlation between Destination Score and ratings of tourists from local, other states as well as the international tourists. This is also indicative that the tested model is logical and the findings are in line with the study. (Field, 2019)

Table 4.4 Regression**Model Summary**

Model	R	R Square	Adjusted Square	Std. Error of the Estimate
1	.667 ^a	.444	.413	1.72645

a. Predictors: (Constant), AVG_ScIT

From Table 4.4 we can note that the tested model is able to explain 67% of the variation and the close similar value of R square with the adjusted R square clearly indicates the fitness of the model. (Saiyidi & Hadrian, 2022)

5. Outcome of Data Analysis (Results and Inferences)

1. To implement proper sewage control it requires a huge financial investment
2. Government protocols and regulations should be implemented to avoid poor waste management.
3. Roadside shops and small houses are making the main road very much congested at old Digha which is also causing traffic disruption.
4. There is a threat of water logging after some rainfall due to poor drainage and sewage systems.
5. Lack of appropriate system for waste disposal at sea shore area near old Digha town and New Digha is continuously causing water pollution.
6. Abundance of plastic usage and other plastic related material is making the coastline dirty.
7. Street vendors and local shops are not having proper space allocation for their business during daytime and peak hours leading to traffic disruption.
8. Practice of throwing waste food and provisions for feeding the migrating birds at shoreline making the coastal areas dirty.

6. Conclusion and Recommendations

Tourism Development is very much important in order to maintain proper tourist flow and also preserving and protecting the resources of a certain destination for future generations. Through this case study it has been observed that the Sustainable Tourism Development always provides a better approach in retaining them. The negative impact of tourism on environmental degradation and also the damages it may cause has been found in the study. As this particular coastal region is under developing stage it has various potential which includes multiple Tourism Development. Usage of solar transport vehicle can be implemented to reduce air pollution. Planned garbage disposal system for both perishable and non-perishable goods near coastal area, food counters and local shops should be made. Accurate Government law and management against litter, sewage and deforestation must be implemented to minimize pollution.

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