

Beach Pollution and Sustainable Tourism in the St. Martin's Island

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Abstract: Beach environment have a close association with tourism in St. Martin's Island. Beach ecosystem is being degraded continuously both by natural process and anthropogenic causes (e.g. haphazard tourism). The present study was conducted in St. Martin's Island, which has immense tourism potential with its extraordinary features. Direct observation and key informant interview method were used to collect data. From the findings, it can be stated that the beach is being polluted with plastic, oil etc. Tourist throwing non-biodegradable materials into the sea. They roam in the beach at night disturbing turtle in laying an egg. There are a lot of dogs who bite local people, tourist and turtle. There are a lot of measures existing in the beach to protect the Island environment but these are not enough and some should be modified. The authority should promote tourism in St. Martin's Island since it's a good income generation source for the Island community. But also need to take care of the Island environment. Many countries (e.g. America, Thailand, Maldives, India etc.) earning foreign exchange without disturbing beach ecosystem. We identify the existing problems and recommend some measures to protect our beach and tourism.

Key words: Beach Pollution • Sustainable Tourism • Anthropogenic Causes • Ecosystem • Saint Martin's Island

INTRODUCTION

The Saint Martin's Island is the popular tourist place with its natural beauty, seaweed and colourful coral. The unique ecological condition is favourable for the growth of coral and seaweed [1]. Tourism started in August and end in April every year. A huge amount of tourist influx occurred in the month of November to March. Almost 3500 tourists visit St. Martin's Island every day during this peak season [2]. Ships and engine boats carry this amount of tourist from Teknaf. As a result, the environment of the sea and Island is being degraded day by day. Tourist polluting the marine environment by throwing non-biodegradable products (e.g. plastic materials, cane etc.) into the sea. The ship also discharging oil and waste materials into the sea. These activities contribute a lot to the pollution of marine ecology [2].

Beach pollution is also mentionable phenomenon due to haphazard tourism. Three types of impacts (economic, social and environmental) of tourism have been identified

by scientists. The impacts of messy tourism can be positive, negative or both at the same time [3-5]. The gigantic amount of tourist is above the carrying capacity of the Island. The wastage products from tourists and local people discharged into the seawater [6]. Moreover, hotels along the sandy beach use lighting that disturbs turtles in laying an egg [7]. Tourist activities (e.g. collection of coral and shells, throwing plastic materials etc.) on the beach also contaminate the beach environment. The roaming and bathing on the rock destroy the coral ecology and uproot the seaweed. Overall, the ecological condition and marine diversity are being degraded gradually.

Sustainable tourism is important for the development within an economic and social context [8], sustainability [9] and effective management [10-11]. The tourism industry is started in the early 1950's and now this industry is making total revenues of almost US \$1, 000 billion and provides direct employment of over 70 million people [12]. Thailand made 54 USD bn in Dec 2017 as tourism revenue, which was 46 USD bn in 2015. This

country earns 53778 USD mn in 2017 from tourism [13]. India adds 2367 USD mn in August 2018 from tourism [13]. While Bangladesh made 175 USD mn in 2016 from tourism [13]. Small islands considerably rely on tourism since tourism has greater economic, socio-cultural and environmental impacts on their livelihood [14].

Bangladesh has two sea beach (one is the world largest sea beach) but our income from tourism is very poor. Though tourism is getting popularity to local people but our tourism authority unable to promote foreign tourist [2]. This mainly due to the environment of the beach and existing facilities. We can follow Thailand, India, Australia to enhance the tourism facilities and their tourist environment. We should not ban tourism, we should promote tourism in a sustainable manner. From this point of view, the present study was conducted in Saint Martin's Island to find out possible sources of beach pollution and effects of haphazard tourism. This study also aimed to provide some effective measures that will be fruitful in protecting the beach and tourism as well.

MATERIALS AND METHODS

Study Site: The present study was carried out in Saint Martin's Island, Teknaf, Cox's Bazar (Fig. 1). The Island located on the west of northwest coast of Myanmar and on the south side of the Cox's Bazar. The island is named after Mr. Martin, a British government official who first took this island under Settlement record. This Island is very popular for tourist due to its scenic beauty. Tourist seasons start from August and continues till April. During this tenure, a massive amount of tourist come to this Island for relaxation, amusement and refreshment. Very few of them are aware of the environment but most of them don't care about the beach environment. Consequently, they are polluting the ocean and beach environment both consciously and unconsciously.

Data Collection: Data were collected in January and February 2019 from the Saint Martin's Island (a busy tourist place). Data were collected by direct observation

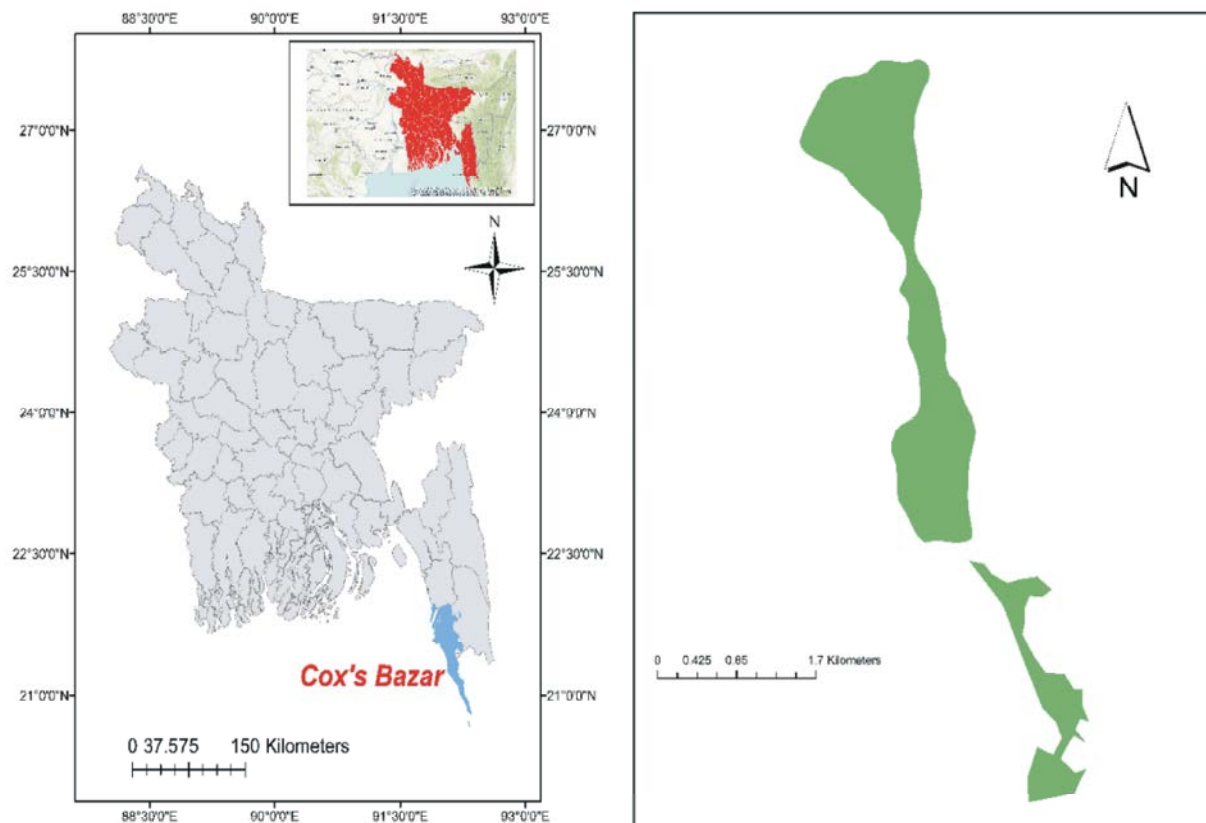


Fig. 1: Map showing the study site (Map created by ArcGIS v.10.3). Left: Map of Cox's Bazar demonstrating Bangladesh. Right: Map of Saint Martin's Island situated in Cox's Bazar district

and key informant interview. A structured questionnaire was used for key informant interview. Then the collected data were validated from the research field. Photos of beach pollution and its causes were taken from study site using a high definition camera.

RESULTS AND DISCUSSION

Causes of Beach Pollution: Beach can be polluted by the various way (e.g. microplastic pollution, Litter/garbage, Oil, eutrophication, sewage etc.) (Fig. 2-7).

Tourism Potential in St. Martin's Island: Small islands are attractive to tourists since they create feelings of remoteness and isolation, peace and quiet and sense of timelessness [10].

St. Martin's Island is one of the most popular tourists place in Bangladesh because of its:

- Attractive natural beauty,
- Seaweed,
- Sandy beach and
- Colonies of colourful corals on a rock
- The road transport, ships and hotels are available here

Tourism is important for some reasons. It ensures

- Economic Viability
- Local Prosperity
- Employment Opportunity
- Social Equity
- Community Wellbeing
- Cultural Richness

Beach Pollution by Haphazard Tourism: Beach pollution started from very early of the set out of ships from Teknaf.

- Tourists throw different plastics, cane and garbage into the sea
- They throw chips packet after feeding birds in ships
- After reaching St. Martin's jetty, tourists and ship authority discharge pollutants into the sea
- Ships dump oil in jetty

Effects of Tourism: Though some measures are being taken to reduce beach pollution that is not seem to be effective. Law enforcement is not strict also. That results in some adverse effect on the environment (Fig. 8-13).

- Aquatic organisms like turtles, Mollusks, Crabs and fish are being found dead
- Seaweed is being uprooted
- Coral bleaching due to beach erosion and sedimentation
- Overdependence on tourism, Leakages, Seasonality
- Competition for resources, land and labour
- Competition for infrastructure
- Socio-cultural impacts

Sustainable Tourism: Now-a-days, tourism has become a vital income generation sector in many islands' countries [15]. Sustainable tourism is very important for a country. While it will generate income sector and employment without deteriorating environment health.

Income:

- For example, on the island of Antigua, tourism receipts account for 58 percent of the Gross National Product (GNP) [16] and
- In the Canary Islands, tourism also accounts for approximately 50 percent of the GDP [17].

Employment:

- In Western Samoa, 10 percent of the jobs are tourism-related [18] and
- In the Falkland Islands, tourism increased household income by providing part-time jobs [19].

Development: Many small islands now use tourism development as a growth strategy to attain greater economic and development performance [20], as well as to diversify their economies.

Socio-Cultural Impacts: Tourism also contributes to small islands' 'renewed interest in local

- Arts and crafts,
- Improvements in educational,
- Leisure,
- Communication,
- Medical and other facilities

Recommendation for Sustainable Tourism in St. Martin's Island: Tourism is important for many island states because it is a source of foreign exchange [21] (Harrison, 2003). But the local people are less beneficiary of Tourism in St. Martin's Island. Some measures must be taken and some existing measures should be modified.



2. Plastic pollution



3. Plastic pollution



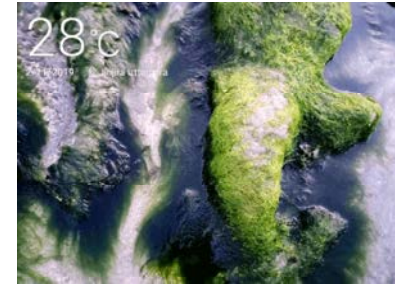
4. Plastic pollution



5. Litter/garbage



6. Oil pollution



7. Algae

Fig. 2-7: Causes of beach pollution ©Md. Simul Bhuyan



8. Uprooted seaweed



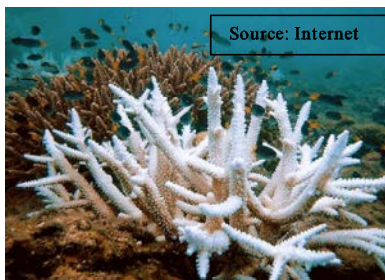
9. Dead turtle



10. Dead fish



11. Dead turtle



12. Coral bleaching



13. Dead fish

Fig. (8-13): Effects of Tourism ©Md. Simul Bhuyan

- Creating awareness among the tourist about beach pollution and its effects on the environment. It must be done all year round. To execute this, mass media (e.g. TV, Radio and Newspaper etc.) can be an effective tool.
- Regular display of Television (TV) on the ship about their activities and how their activities pollute the marine environment.
- Regular monitoring of tourist activists. Tourist shouldn't feed birds.

- Tourist shouldn't throw non-biodegradable components (e.g. plastic materials) into the sea.
- Using CCTV and implement punishment (e.g. compensation of money) on a regular basis.
- After reaching St. Martin Island, ship authority must amass the plastic materials in some safe place instead of discharge into the sea. Every ship must be punished with a high amount of money as compensation for discharging wastes into the ocean.
- On the beach, there must be a lot of portable dustbins and basket.
- Use given and taken policy. If someone (only local people) give plastic materials, they will be gifted.
- Upcycling the oceans on a regular basis. The collected plastic will be recycled to manufacture clothes, shoes and bags.
- Instead of a dog, use CCTV. Dog bites tourists and local people and it is very difficult getting vaccine here. Moreover, the turtle could not come to the beach for laying an egg. They are attacked by dogs frequently.
- Use multimedia presentation in every tourist crowd point about their activities (what can they do and what can't).
- On spot, punishment must be implemented and for this should use the mobile court.
- Restriction on the entrance on the rock where seaweed and coral inhibit.
- Residence close to the beach should not use a light after 10 p.m. since turtle face disturb in coming to the beach and lay an egg.
- All kind of sound system (e.g. DJ party, singing song etc.) and *Fanus* also should be banned especially at night.
- Provide an easy loan to local people and ownership of the business in every tourism activities. Restrict outside people business here to improve the socio-economic condition of the local community.
- Overall, strict law enforcement must be ensured.

CONCLUSION

Tourism should be promoted considering the ecosystem and biodiversity of the Saint Martin's Island. The environment of the Island should be protected via eco-friendly tourism practice.

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