

Marine Litter: A Persistent Cumulative Threat to Bangladesh Environment

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Abstract

Marine litter, now a days, is a fundamental ubiquitous problem which arises from human activity, either intentional or unintentional. Very limited research has been found on marine litter in Bangladesh. Department of Environment (DoE) has been assigned to prepare a Country Report on Marine Litter in Bangladesh under a South Asia Co-operative Environment Programme (SACEP) in South Asian Seas (Region). For the preparation of the country report a survey was conducted by the University of Dhaka on the coastal region of Bangladesh. This article examines the magnitude and severity of marine litter and plastic pollution at Cox's Bazar Sea Beach of Bangladesh and mentioned the existing rules and regulations of government of Bangladesh to tackle the growing threat from marine litter.

Key Word: Marine Litter, Bangladesh, Marine Pollution, Coastal Area Pollution, Plastic Pollution

1. Introduction

Marine litter has been a serious and growing problem for some decades now (Michelle E. Portman 2017). Marine litter is any persistent, manufactured or processed solid material discarded, disposed of or abandoned in the marine and coastal environment (UNEP 2021). Marine litter consists of items that have been made or used by people and deliberately discarded or unintentionally lost into the sea and on beaches including such materials transported into the marine environment from land by rivers, draining or sewage systems or winds. For example, marine litter consists of: plastics, wood, metals, glass, rubber, clothing, paper etc. This definition does not include semi-solid remains of for example mineral and vegetable oils, paraffin and chemicals that sometime litter sea and shores (F. Galgani 2010). According to the European Environment Agency, approximately 10 million tons of litter end up in the world's oceans and seas each year. According to the United Nations Environment Programme (UNEP), 80% of the marine

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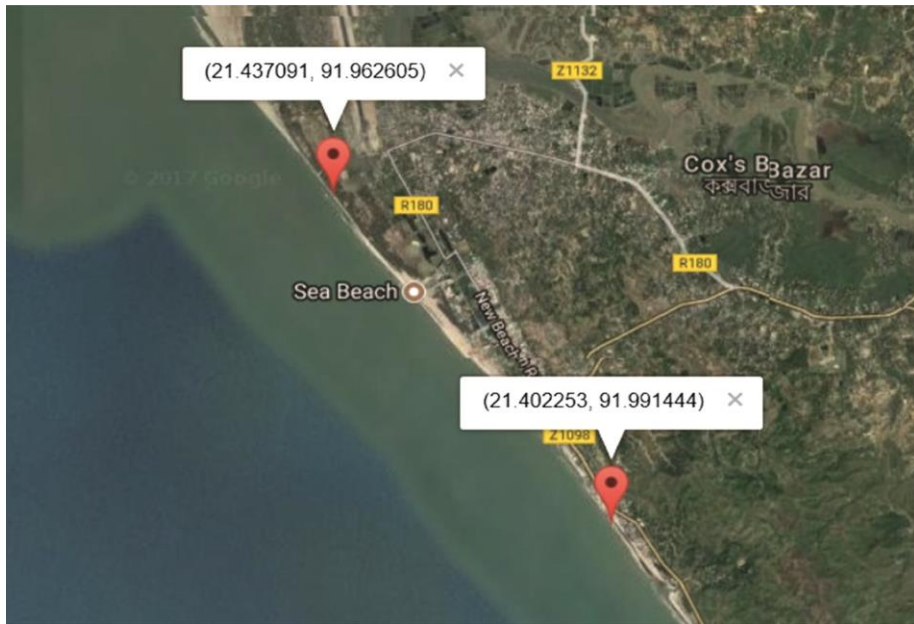
litter originates from land-based sources including waste released from dumpsites nearby the coast or river banks, the littering of beaches, tourism and recreational use on the coasts, fishing industry activities, and ship-breaking yards. The primary sea-based sources include abandoned, lost, or discarded fishing gear, shipping activities, as well as legal and illegal dumping (Eric P. Chassignet 2021).

Marine litter has already been recognized Asian emerging threat to the seas globally (Hindrik Bouwmana 2016). In recent years, it has become a significant environmental concern for governments, scientists, and stakeholders (Seltenrich 2015).

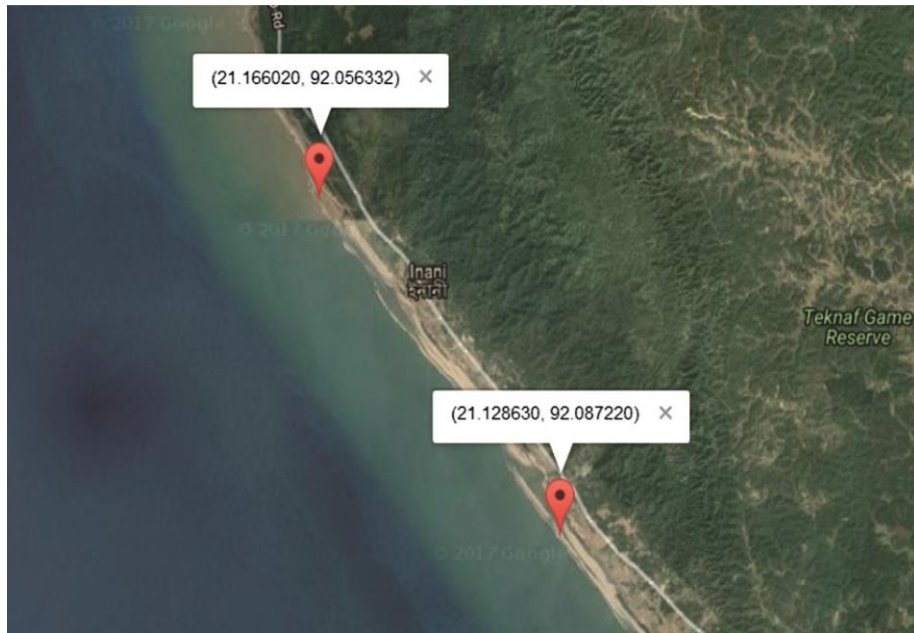
It is gradually becoming a serious concern for the world as well as for the South Asian Seas (SAS) region including Bangladesh. A total of 528.12 kg marine litter was estimated within 98.01 km (5.39 kg/km of the Bay of Bengal coast of Bangladesh (South Asia Co-operative Environment Programme (SACEP) 2007). Actions must be taken to prevent and reduce the impacts of the marine litter on ecosystem, economy and society. However, data on marine litter is limited in the entire SAS region. The South Asia Co-operative Environment Programme (SACEP) has attempted to develop a data base to generate required data on marine litter along with microplastic, and prepare a regional action plan for the SAS region. As part of this, the Ministry of Environment, Forest and Climate Change (MoEFCC) of the People's Republic of Bangladesh through its Department of Environment (DoE) has prepared a Country Report on Marine Litter in Bangladesh highlighting the national status including database, proposed recycling enterprise and interventions. The country report has been prepared on the basis of a preliminary marine litter survey on the two beaches of Cox's Bazar District. The survey was conducted by the the Oceanography Department of University of Dhaka through Department of Environment with the financial help of SACEP. The survey was conducted by using the counting method. (Source: Department of Environment)

2. Marine litter: Status in Bangladesh

There has been no empirical study of the status of marine litter in Bangladesh to date. Thus, a preliminary case study was conducted at two beaches (Laboni Sea beach & Inane Sea beach) on the coast of Cox's Bazar in November 2017. Laboni sea beach and Inane Sea beach are the parts of the longest, about 120 km, and most visited tourist sea beach in the world. The selected locations of the study area are shown in Figure 1.



(a)



(b)

Figure 1: Location of the surveyed areas of (a) Laboni sea beach, (b) Inani sea beach

Cox’s Bazar is the most popular tourist spot in Bangladesh. Total amount of marine litters recorded from the two beaches in Cox’s Bazar district was 4573 items. The identified litter types and their quantities are given in Figure 2. It implies that the plastic litters are in the top position (67%) compared to other types of litter followed by cloths and paper-based products.

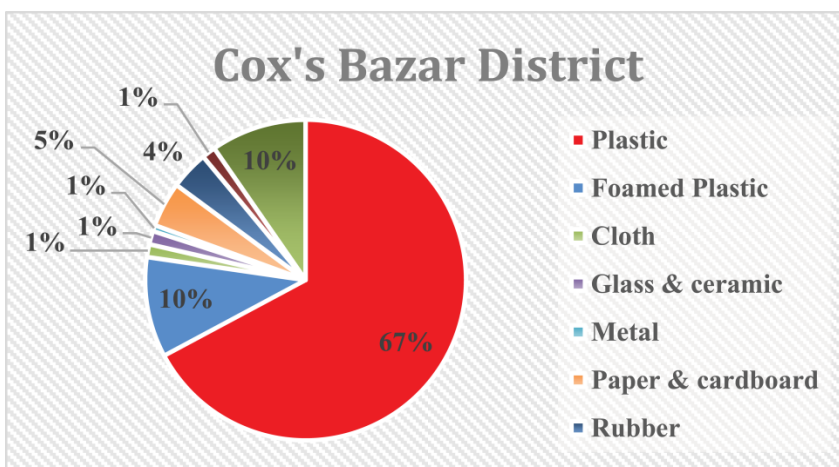


Figure 2: Total marine litter recorded from Cox’s Bazar in November 2017.

3. Laboni Beach (Cox’s Bazar)

Laboni beach is the most popular and crowded sea beach in Cox’s Bazar. A total of 831 items of marine litters was recorded and their categories and sub-categories are shown in Figure 3 and Figure 4.

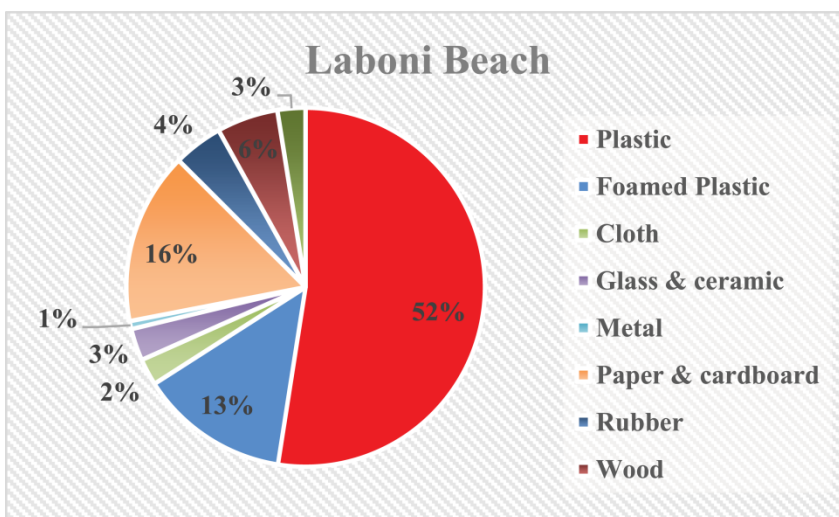


Figure 3: Marine litter observed in Laboni Beach, Cox’s Bazar in November 2017

Plastics were the most prevalent form of marine litters recorded from the beach. Plastics are mostly used material as a carrying bag, food package, carrying footwear, mobile, cloth etc.

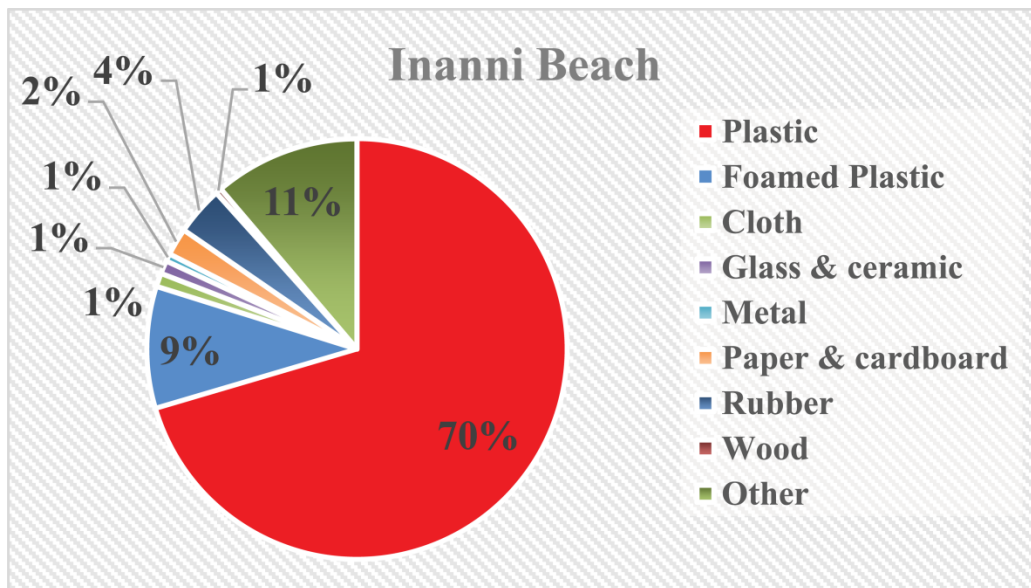


Figure 4: Types of marine litters found in Laboni Beach, Cox’s Bazar in November 2017

Among the plastic categories, plastic bags (opaque & clear) are dominant followed by the cigarettes, butts & filters. Within the categories of foam, cloth, glass and metal, foam (insulation & packaging) is the most dominating materials (red color) that is used for icebox and preserving fish in the fishing vessel. In the paper, rubber, wood and other categories, paper (including newspapers & magazines) is the most abundant (red color) which might be due to the fact that most of the beach hawkers used various forms of papers (including newspapers & magazines) as their packaging materials.

4. Inani Beach (Cox’s Bazar)

Inani beach is located near Himchari Hill which is little bit far from the Cox’s Bazar main city. A total of 3742 items of marine litter was recorded and their categories and sub-categories are shown in Figure 5, 6 & 7.

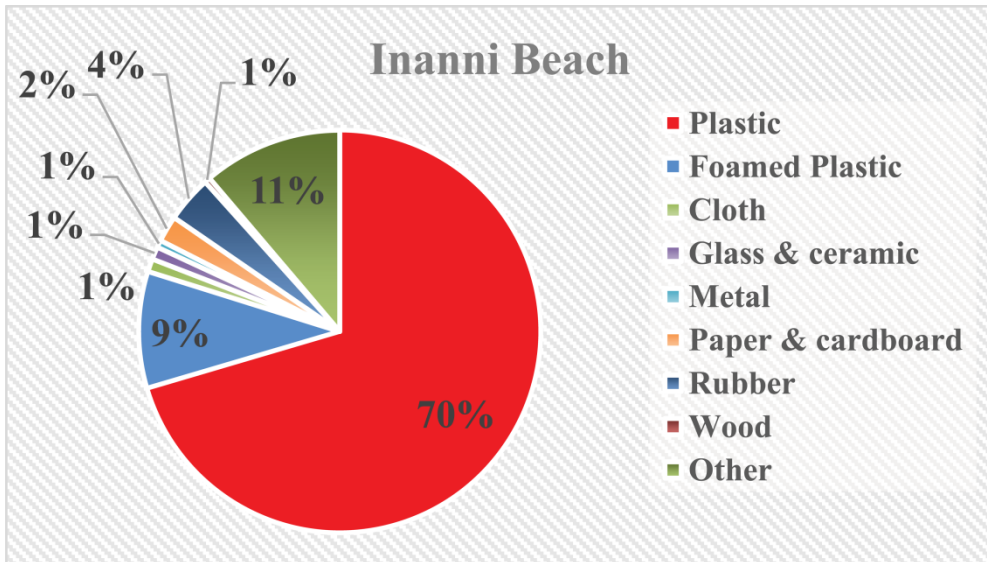


Figure 5: Marine Litter observed in Inani Beach, Cox’s Bazar.

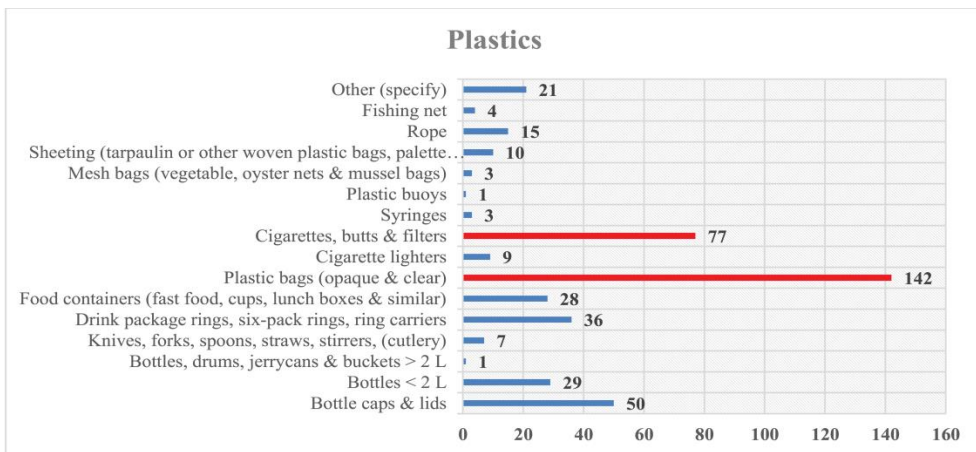


Figure 6: Quantity of plastic litter in Inanni Beach area, Cox’s Bazar.

In the Inani Beach, the abundance of plastic bags (opaque & clear) is higher than the other type of plastic materials. In the foam, cloth, glass and metal categories, foam (insulation & packaging) is the most dominating item that is used for icebox and preserving fish in the fishing vessel. In the paper, rubber, wood and other categories, coconut-based litter is the most abundant. In the Inani Beach, the coconut is available with its cheaper price and tourists throw coconut waste onto the beach after drinking its water.

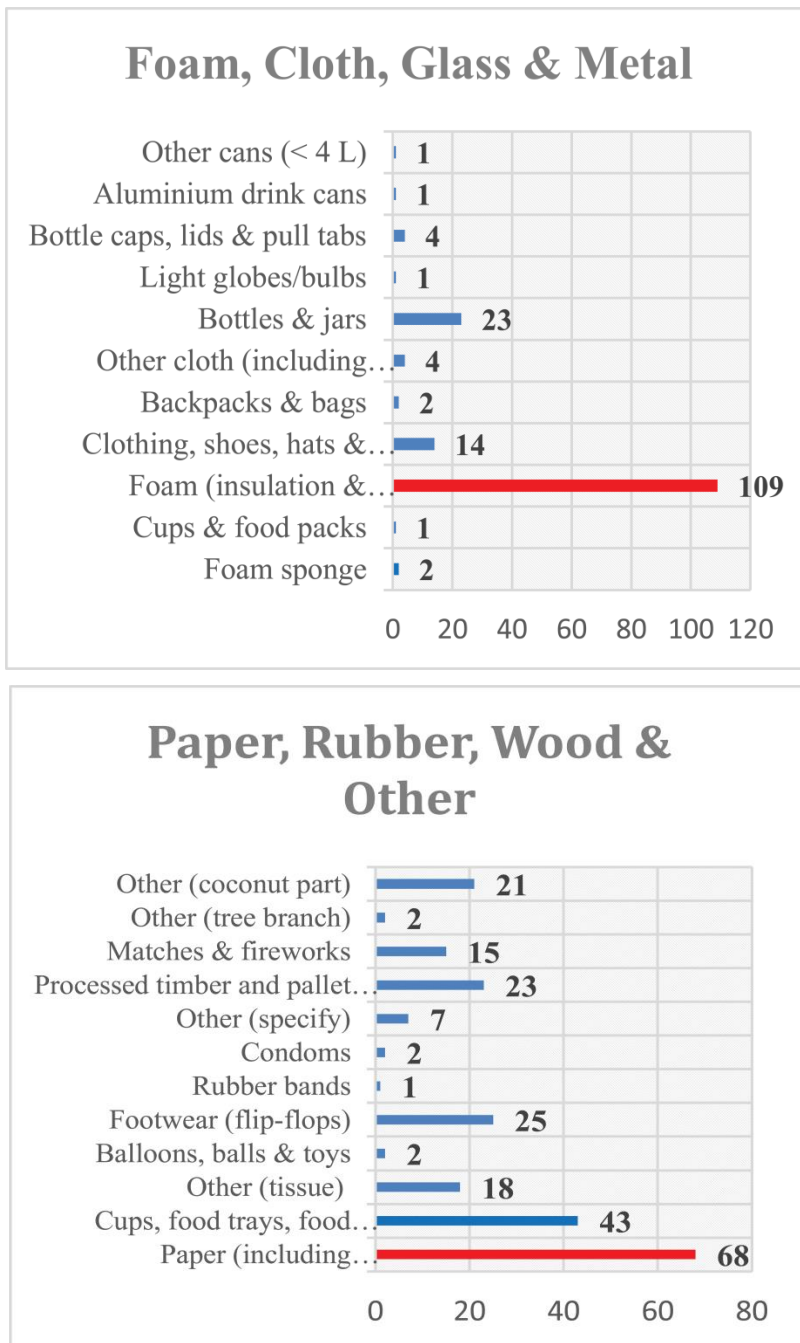


Figure 7: Foam, Cloth, Glass & Metal and Paper, Rubber, Wood & Other types of marine litters found in Inani Beach area, Cox’s Bazar in November 2017

The UNEP/IOC Guidelines on Survey and Monitoring of Marine Litter (2009) was followed for the specification of sampled marine litters. The reveals that the plastic is the most abundant litter type in the Bay of Bengal coast of Bangladesh. The source of marine litter can be grouped into two categories: land-based and sea-based sources. Most of the debris come from land-based sources in different ways. Some of the major land-based sources of marine litter are sewage, municipal waste, industrial waste etc. whereas, the sea-based sources are merchant shipping, ferries and cruise liners, fishing vessels, offshore oil and gas platforms, fish farming installations etc. Sea-based debris can come from commercial fishing and boating activities (fishing gear, foam plastic (insulation), rope, fishing nets, traps and buoys; tied bottles and cans) shipping activities in the Bay of Bengal. Of all the debris items found on the Bangladeshi coast, 90% was land-based. Sea-originated debris was 10 %. The overall dominance of land-based items is consistent with the land-based origin of the top debris items found on the beaches. Plastics seem to be the most common type of marine litter in worldwide (Gregory 2009). Bangladesh is not an exception to that.

5. Existing policies, acts, rules & regulations of Bangladesh for tackling Marine Litter

There is no marine litter policy in the country directly. However, to tackle the environmental pressures created by solid waste disposal, ship-breaking and lube oil discharge at sea, the Bangladesh Government uses the provisions of the Environmental Conservation Act and Regulations. Different policies and strategies indirectly related to marine litter are adopted by the different organization. Some important acts, rules, policies and strategies are as follows:

- National Environment Policy 2018
- Bangladesh Environmental Conservation Act 1995 (lastly amended 2010)
- Environmental Conservation Rules 1997
- Solid Waste Management Rules 2021
- Ecologically Critical Area Management Rules 2016
- Bangladesh Biological Diversity Act 2017
- Marine Pollution Ordinance 1977
- Integrated Coastal Zone Management Plan (ICZMP)
- Coastal Development Strategy (CDS), 2004
- Coastal Zone Policy, 2005
- Coastal Zone Strategy, 2006

Besides these, there are some other policies. However, and as much as policies and strategies were taken, their effective diminish gradually with time duration due to many social and political issues.

6. Conclusion

Marine litter is a global concern, affecting all the oceans of the world. Every year, millions and millions of tons of litter end up in the ocean worldwide, posing environmental, economic, health and aesthetic problems. Poor practices of solid waste management, wastewater (including storm water) collection and treatment, lack of infrastructure and awareness of the public at large about the consequences of their actions aggravate substantially the situation. Cleaning up the oceans is one option; it is however not the most efficient method against marine litter. The solution is to tackle the problem at its source. Collaboration with industries, non-governmental organizations and other development partners might be effective. Marine litter is also one of the clearest symbols of a resource inefficient economy. Valuable materials are polluting our beaches and damaging our environment instead of being pumped back into our economy. Therefore, a circular economy approach which puts the emphasis on preventing waste and on recycling and reuse of materials and products in the first place, is the best solution to the marine litter problem. Indeed, a continuous review of the monitoring, innovation and improvement of the activities needs to be addressed in a timely manner.

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