

Briefing Note

WRAPPED IN PLASTIC: The State of Plastic Pollution in Bangladesh

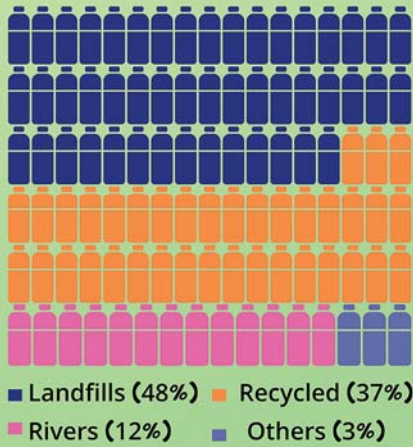
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Wrapped in Plastic

Mismanaged plastics are on the rise in urban areas of Bangladesh

Overview of plastic pollution in Bangladesh

The total plastic waste in Dhaka was **646 tons** in 2020



Bangladesh was 10th among top 20 mismanaged plastic waste generating nations in 2010



Effects of plastic pollution

Plastic articles degrade into microplastic, which endangers marine biodiversity significantly



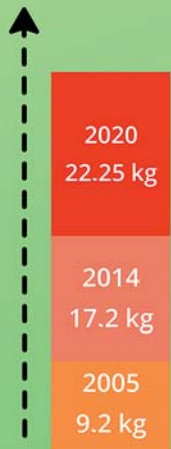
Due to plastic pollution, one-third of Dhaka's canals cannot transport rainwater into rivers



In Bangladesh, plastic waste is often incinerated which leads to air pollution and human health hazard



The estimated clean-up cost of plastic waste for the government was as high as 30% of the total revised budget for the MoEFCC in 2020



Per capita plastic consumption has more than doubled in Dhaka in the last 15 years.

The Way Forward

1 Plastic wastes have to be separated at the source which will enable waste collectors to sell all kinds of plastic wastes including single-use plastics (SUPs)

2 The city corporations need to facilitate a network between plastic manufacturers and waste collectors to increase the collection of all types of plastic items

3 The government and the private sector needs to collaborate to create a market for SUPs



4 Producers need to take responsibility to design products that are sustainable and easier to recycle

5 Research and development and investment are needed to explore the ways in which plastic wastes can be turned back into petroleum through pyrolysis

6 It is important to reduce the quantity of plastic entering the value chain by promoting the use of sustainable, affordable, and alternative materials to plastic

WRAPPED IN PLASTIC: THE STATE OF PLASTIC POLLUTION IN BANGLADESH

Highlights

- The production of plastic products needs to be minimised as recycling alone is not sufficient to tackle plastic pollution.
- City corporations bear a substantial amount of the clean-up cost due to indiscriminate disposal of single-use plastic products.
- In Bangladesh, there is a potential to create a circular market for single-use plastic products if there is a proper network between waste collectors or local recycling shops and plastic manufacturers.

1. INTRODUCTION

Plastic waste, regardless of its source, inevitably ends up in the ocean. As per the World Economic Forum, it is hypothesised that by 2050 there will be more plastics than fish in the ocean (WEF, 2016). Plastic wastes have been accumulating at a rapid pace all across the world including in both developed and emerging nations. In 2010, Bangladesh was one of the top 20 mismanaged plastic waste-generating nations (Jambeck, et al., 2015). Although Bangladesh produces less plastic waste as opposed to other developed nations, the amount of mismanaged plastic waste remains a concern. Mismanaged plastics are wastes that are not adequately managed or properly disposed of and are just discarded in open landfills (Kibria, 2017). Plastic pollution is a topic of interest that has recently gained momentum in Bangladesh. Although each municipal government in Bangladesh is ultimately in charge of overseeing waste collection and management, the informal sector collects the vast majority of the waste (UN, 2010). Incidentally, attempts made to separate plastic wastes for recycling purposes are mostly conducted by the informal sector in Bangladesh. Dhaka, Bangladesh's largest city with a population of 10 million, generates most of the country's urban waste followed by Chittagong (BBS, 2022).

The amount of plastic pollution in Bangladesh has received very little attention over the years, although from the data it is evident that plastic pollution in Bangladesh is on the rise as urbanisation escalates. Daily waste production in the Dhaka metropolitan area is 6,646 tons, 10 per cent of which is plastic. Less than half of the plastic waste in Bangladesh gets recycled while 48 per cent reaches landfills, and the rest is either dumped in rivers or discarded in drains and in other areas of the city corporations (The World Bank, 2021). Furthermore, the advent of COVID-19 has exacerbated the state of the plastic pollution as individuals relied on single-use plastic more for fear of infection and spread of the virus. Hence there is a cause for concern relating to plastic pollution in urban cities of Bangladesh.

2. DRIVERS OF PLASTIC POLLUTION

Water systems acting as a medium of plastic pollution: Rivers play a significant role in being one of the key drivers of plastic pollution by directing mismanaged plastic wastes from one region to another. The river Ganges is the second largest river source of plastic pollution to the world's oceans (Chowdhury, et al., 2020). The Ganges branches out into Padma and Meghna which consequently converges into the Bay of Bengal. According to a study, about 89 per cent of plastic waste is mismanaged in the coastal areas of Bangladesh (Jambeck, et al., 2015). Wastewater is often discharged into the river systems of Bangladesh from urban and industrial areas. Amidst different

variants of pollutants, mismanaged plastic waste is identified to be a significant source of contamination in the water system (Kibria, 2017). It should be mentioned that most of the rivers in Bangladesh are transboundary rivers, and therefore, a significant amount of the plastic waste near coastal areas is not locally produced but it is coming from neighbouring countries. Managing plastic waste that is entering Bangladesh from other countries is an additional burden on Bangladesh. Since India has recently outlawed single-use plastics, Bangladesh might end up becoming the next single-use plastic hotspot.

Unregulated production of plastic products: Plastic industries also contribute considerably to the growing mismanaged plastic waste in Bangladesh. There are about 5,000 plastic manufacturers that are operating in Bangladesh and employing about 1.2 million individuals (BIDA, 2021). These manufacturing units are producing a great volume of plastic products to meet both domestic and international consumer demand. The average per capita consumption of plastic has increased from 3 kilograms (kg) per year in 2005 to 9 kg per year in 2020. In Dhaka alone, the average consumption of plastic has increased from 9.2 kg annually in 2005 to 22.25 kg per year in 2020 (The World Bank, 2021). Plastic manufacturers produce an array of plastic products such as kitchen and tableware, lids, bottles, sanitary products, toys, packaging, and construction materials. Manufacturers also produce accessories such as plastic hangers and clear film, buttons, conveyance materials and other plastic parts for other sectors including textiles, pharmaceuticals, and electronics (BIDA, 2021). Total plastic export increased from 56.8 million kg in July 2018 to about 63 kg in December 2019. The plastic sector grew slowly during the initial wave of COVID-19. With the easing of constraints, however, the production of plastic has begun to rise dramatically once more. The total weight of plastic goods exported from Bangladesh to foreign nations as of July 2021 was 55 million kg. The growth in plastic output that is being exported indicates that pre-COVID levels of plastic production may soon be surpassed (EPB, 2021).

Excessive consumption and indiscriminate disposal of single-use plastics: Single-use plastics are the most frequently used plastic products in not just Bangladesh but all over the world. Single-use plastics such as plastic bags, clear plastic thin wraps, coffee cups and lids, utensils, straws, coffee stirrers, caps, and bottles, are generally used once and then disposed. As of 2019, a survey suggested that individuals throw away about 87,000 tons of single-use plastics every year in Bangladesh. Approximately 96 per cent of this waste comes from consumer items, 33 per cent of which are non-recyclable sachets. A major fraction of the single-use plastic is not disposed of properly and therefore these end up as wastes in landfills and river systems further polluting the environment.

The surge in the use of single-use plastics driven by COVID-19: The plastic scenario in urban areas of Bangladesh has been a growing concern, which was exacerbated by COVID-19. The informal sector is mostly responsible for the collection of waste from households and landfills in Bangladesh. However, during the pandemic, most of the waste collectors were unable to work owing to the infection and associated lockdown restrictions which made plastic waste collection less frequent. Due to the fear of infection, individuals changed their lifestyles and began to be more reliant on single-use plastics. Single-use personal protective equipment (PPE), medical masks, plastic gloves, and polythene bags have all become increasingly popular. This change in consumption choices has increased the volume of plastic wastes leading to plastic pollution. Despite the ban on polythene bags in Bangladesh since 2002, the use of these disposable single-use plastic bags has only increased. Polythene bags are the main source of single-use plastic waste in Bangladesh (ESDO, 2021).

Inadequate waste management: Another major driver of plastic waste generation is the lack of awareness and initiatives taken at the household level. In Bangladesh, plastic is not segregated at the source. Households compile all their wastes together before disposing of it. This also contaminates the plastics that could have been separated and recycled at a later stage of waste treatment. The informal sector mostly collects PET bottles as they have a high market value and can be cleaned easily even if they are soiled. Materials such as polythene packaging, Low Density Polyethylene (LDPE) items, and

multilayer plastic (MLP) products are often not collected by waste collectors as they supposedly have a lower market value, do not melt easily, and require a lot of time to separate and collect. MLP such as packaging for crisps and other food products are difficult to recycle as the recycling industry does not have the proper technology. As a result, a major proportion of polythene bags, packaging, wrappers, and MLPs accumulate in landfills (The World Bank, 2021).

3. IMPACTS OF PLASTIC POLLUTION

Environmental impacts: The most harmful effect of plastic waste on the surrounding air may be ascribed to deliberate or unintentional open-fire burning. Burning solid waste is a prevalent practice in Bangladesh to minimise the amount of litter in landfills and urban areas. However, due to a lack of awareness and segregation, these wastes contain plastic items, which are also burned. Incinerating plastics made of PVC presents the greatest threat to air pollution (Hossain, Rahman, Chowdhury, & Mohonta, 2021). The most apparent effect of plastic waste mismanagement has been observed in water bodies. Plastic waste accounts for much of the marine pollution in coastal areas of Bangladesh. In areas such as in Cox's Bazar, tourists and visitors throw away single-use plastic items on the beach which ultimately ends up in the sea. Due to rainfall, plastic waste from landfills in Bangladesh are also deposited in canals and riverways in the surrounding urban cities. Plastic wastes clog canals and sewage systems as well. In the city of Dhaka 22 out of 65 canals are now transformed into dumping zones mostly, due to plastic pollution (Hossain, Rahman, Chowdhury, & Mohonta, 2021). Plastic articles degrade into microplastic, which endangers marine biodiversity significantly. Microplastics are mistaken for food by marine species, who eventually suffer from indigestion and digestive system damage from cellular necrosis, swelling, and tearing. According to a survey conducted in Bangladesh's three major cities of Dhaka, Chittagong, and Sylhet, larger fish such as catfish were found to have more microplastic in their bodies as opposed to the smaller fish (ESDO, 2016).

Health impacts: Products made from plastic contain various additives such as Bisphenol A (BPA), phthalates, and other chemicals which can be hazardous to both the environment and to human health. Often street vendors in Bangladesh serve tea and coffee in plastic cups. Under heat, these additives can leach out and enter the human bloodstream which may cause negative health impacts (Proshad, et al., 2018). Plastic affects human health at every stage: from extraction to production to utilisation and to disposal (Azoulay, et al., 2019). From the consumer end, the impact of plastics is felt either through skin contact or inhalation and ingestion. Plastic pollutants can also enter the human body through the food chain as individuals may consume fish contaminated with plastic particles. Burning plastic wastes releases toxins such as furans and dioxins like persistent organic pollutants (POPs) that worsen the respiratory diseases, and heart ailments, and can damage the nervous system (Verma, Vinoda, Papireddy, & Gowda, 2016). Plastic wastes have collapsed sewage systems by disrupting natural channels and suffocating drainage systems. This causes flooding during the monsoon season, in the streets of Dhaka and Chittagong for several days. Flooded streets lead to mosquito-borne diseases such as dengue and malaria (Hossain, Rahman, Chowdhury, & Mohonta, 2021). Another current concern is that single-use plastics may contribute to the spread of the SARS-CoV-2 virus. The COVID-19 virus can survive up to 3 days or 72 hours on plastic wastes which can be hazardous to human health considering how single-use plastics are disposed of indiscriminately (Prata, Ana L.P. Silva, Walker, Duarte, & Rocha-Santos, 2020). The virus can potentially spread through disposed face masks, plastic hand gloves, as well as other discarded PPE which are collected by waste collectors or other representatives from the municipalities without taking any cautionary measures. The informal sector in Bangladesh comes under great risk to be exposed to the infection while potentially spreading the virus to those they are encountering (ESDO, 2020).

Economic impacts: Most literature pivot more towards the environmental and health impacts of plastic pollution, yet the economic costs of plastic pollution are seldom debated over. In Bangladesh, the tourism business has a huge potential to not only contribute significantly to the country's GDP but also

to provide jobs and employment for millions of individuals. However, plastic pollution or improper waste management may have a significant negative impact on the tourism, and aquaculture and fishing industries. The persistent accumulation of plastic debris near coastal areas with the associated putrid odour can make such regions less appealing to tourists. Furthermore, the increasing prevalence of microplastic-contaminated fish may render marine creatures unfit for human consumption. This may also affect the export volume for fishes in the long run as Bangladesh may not meet the sanitary and phytosanitary (SPS) measures of partner countries. Additionally, the expense of clean-up costs can be a burden on local governments and municipalities. Municipalities in every region are stipulated to a designated budget. However, it is often seen that most of the budget is used up to cover the expenses of clean-up costs, as waste collectors transport wastes from the streets and secondary dumping stations to landfills. The highest estimated clean-up cost for Bangladesh was estimated in 2020 to be as high as 30 per cent of the total revised budget for the Ministry of Environment, Forest, and Climate Change (MoEFCC) in 2020 (The Ocean Cleanup , 2022; MoF, 2021).

A further unevaluated cost of plastic pollution is the cost of treatments for health conditions caused by plastic pollution, especially for the waste collectors in the informal sector. Although further research is required to analyse the direct health costs of plastic particles, clogged drains and sewage system due to plastic wastes do increase the potential for waterborne diseases in urban areas. Such a health burden will increase out-of-pocket expenditure towards medical bills which will affect the savings for waste collectors further pushing them towards poverty.

4. EXISTING POLICIES IN BANGLADESH TO REDUCE PLASTIC POLLUTION

As per the Environment Act 1995, Bangladesh imposed a ban on plastic shopping bags in 2002. However, the ban proved to be ineffective due to lack of alternatives and enforcement from regulators (MoEFCC, 1995). The High Court issued an order in 2020 to rigorously enforce the prohibition on plastic bags across the nation. This comprises of routine market observation, the closure of firms that make polythene bags, and the forfeiture of equipment. The High Court also issued a ban on carrying, selling and advertising of plastic carrier bags and other single-use plastics such as straws, cotton swabs, cutleries, bottles, food containers and plastic plates in hotels and restaurants in coastal areas (Writ Petition , 2020). In 2010, the National 3R Strategy for Waste Management was adapted. The National 3R Strategy involves reducing, reusing, and recycling which stipulates proper waste management streams to mitigate waste disposal in open fields, waterways, and flood plains by 2015 (DoE, 2010). However, due to lack of enforcement and inadequate institutional infrastructure, almost all the households do not segregate their wastes which makes recycling a difficult task for waste pickers.

Apart from the ban on plastic bags and the National 3R Strategy, there were several other initiatives taken by the government to reduce either plastic or solid waste mismanagement in Bangladesh. However, the current rules in place regulating plastic pollution are either insufficient and or not implemented. For example, authorities prohibited the use of polythene bags without including any restrictions on the sources of plastic bags or the technology used to create them. Furthermore, Bangladesh has placed the National 3R Strategy for Waste Management considering the growing importance of the circular economy, yet does not have a designated action plan to tackle the challenges of plastic waste at all stages of its value chain.

5. THE WAY FORWARD

Perhaps the most significant impediment to recycling plastic waste in Bangladesh is an absence of recycling technology, and waste segregation at source. Furthermore, using recycled plastic waste as a raw material for the production of plastic goods is more expensive than using virgin plastic resins. This is due to the energy-intensive nature of recycling, which requires high temperatures to melt the recycled

plastic pellets. Moreover, the informal sector may not be socially conscious of the significance of appropriate waste management systems.

However, recycling is not the solution to plastic pollution. It is crucial to minimise the quantity of plastic that enters the value chain in the first place. Currently, plastics are the most adaptable and cost-effective material available in Bangladesh. Therefore, Bangladesh requires a market-based approach to mitigate the use and production of polythene bags. Despite the current restriction on polythene bags, the government lifted the 5 per cent supplementary duty on all plastic or polythene bags in FY2022 (MoF, 2022). This undermines the argument for a circular economy and makes it more difficult to limit plastic pollution. So, proceeding forward, it is important to keep a few essential parameters in mind:

1. Plastic wastes must be separated at the source which will enable waste collectors to sell all kinds of plastic wastes including single-use plastics.
2. The city corporations need to facilitate a network between plastic manufacturers and waste collectors to increase the collection of all types of plastic items.
3. The government and the private sector need to collaborate to create a market for single-use plastics.
4. Producers need to take responsibility to design products that are sustainable and easier to recycle.
5. Research and development as well as investments are needed to explore the ways in which plastic wastes can be turned back into petroleum through pyrolysis.
6. It is important to reduce the quantity of plastic entering the value chain by promoting the use of sustainable, affordable, and alternative materials to plastic.

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This briefing note is part of a series of publications under CPD's Green Cities Initiative which CPD is implementing in collaboration with KIVU International and the International Growth Centre (IGC), with support from the Foreign, Commonwealth, and Development Office (FCDO), UK.



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