

## PLASTIC POLLUTION, ITS CAUSES AND IMPACTS ON ENVIRONMENT AND LIVELIHOOD: BANGLADESH CONTEXT

KUDRAT-E-KHUDA (BABU)\*

*Department of Law, Daffodil International University, Bangladesh*

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### ABSTRACT

The plastic derived product has now become an essential commodity of our daily life. A large volume of used plastics poses serious environmental threats resulting danger for marine life, decrease in the soil fertility and pollution of ground water. For the developing country like Bangladesh, it is very difficult as well as challenging also to maintain and manage the control of the pollution of this vast plastic waste. The major reasons of deficient plastic management in Bangladesh are scarcity of facilities, infrastructure development, and inadequate allocation for waste management. Neither is any significant or effective actions taken or there is no particular or specific law to control the ongoing plastic pollution. The prevailing environmental laws in the country are not adequate enough to address the problem while its implementations are also largely absent. The paper aims to determine the causes of plastic pollution and its impacts on the environment and livelihood; to scrutinize the prevailing related laws and policies and to conclude with recommendations to stop plastic pollution in Bangladesh. The paper makes use of secondary data, *i.e.* books, articles, national and international law reports, Acts etc.

**KEY WORDS :** Plastic pollution, Bangladesh, Environment, Impact, E-waste management.

### INTRODUCTION:

Starting its journey in 1960s, plastic and plastic goods sector has emerged as an emerging sector in Bangladesh. The advantageous and accessibility of plastic materials especially PVC (Polyvinyl chloride) bags less than 55 micron—growth of which sharply increased over the years—has contributed a lot to help the industry grow. For its contribution to income generation and employment, the industry has become one of the significant subsectors of the Bangladesh economy (Ahmed, 2019). Over the years, the growth of the plastic manufacturing industry is astounding. According to the report (2015) of the IDLC Finance, the industry's average growth rate 20 percent per year. From the 2015-2016 fiscal years, Bangladesh started exporting plastic products including plastic waste. In the previous fiscal years 2018-19, the country exported a total of USD 477 million (OECD, 2019). Among the total amount the direct export was USD 120 million while the indirect export was

USD 357 million (Ayan, 2018). Per year Bangladesh shipped approximately 0.4 million of tons of plastic raw materials including HDPE, LDPE, PP, PET, PVC, PC and PS. Among these types of plastic, PVC is the most dangerous and hazardous (Brinkmann and Kvale, 2015). The country generates approximately 0.8 million tons plastic waste annually. Out of the total amount, nearly 36 percent of the plastic waste is reprocessed and around 39 percent is dumped, while the remaining 25 percent is regarded as leakage or unattended and makes its way into marine ecosystem (Waste Concern, 2019). About 10 percent of the plastic waste is single used plastic that cannot be reprocessed. Consequently, these find their ways into landfill and water bodies. The plastic contamination of Bay of Bengal ought to preferably incorporate both Bangladesh and its neighboring countries and the amount will be a much higher than national appraisals. The tissues of animals have been reported to contain with small scale and nano-plastics eventually entering into the food chain which is very dangerous (Sultana, 2019).

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\*Associate Professor

The section 6(A) of the Bangladesh Environmental Conservation Act 1994, impose a ban on polythene bags which are less than 55micron in thickness. Considering its hazardous effects on human health and environment, the High Court recently ordered the concerned authorities to impose a ban on single-use plastic goods in coastal areas, hotels, motels and restaurants all over the country. Due to the shortage of human resources in the Department of Environment, the effective implementation of this act could not be enforced completely.

### **Main concern of plastic pollution**

The over production and consumption of plastic which is perceived as one of the best inventions of all ages has turned into a curse in recent times. The ever-expanding plastic production, utilization and waste generation are increasing the level of danger to marine terrestrial environment and have transmuted its most appealing features into a curse. However, plastic pollution does not receive proper attention until it pollutes the marine ecosystems and the beauty of the seas. Moreover, the majority of the plastic products have attributes which can only be sued once. According to the UNEP, 2018 report, plastic packaging materials constitutes half of the world plastic waste. The majority of this waste is generated in Asia while the largest sources of per capita plastic waste are America, Japan and European Union. However, out of nine billions tons of plastic tons only nine percent has been recycled. Almost all of the plastic materials are non-disposable waste and break down into tiny fragments known as micro plastics. One of the main causes of marine pollution is plastic pollution that kills a million sea birds each year (Shimo, 2014). Plastic is decomposable if exposed to ultraviolet radiation, a Florida research says, but it can take years to reach the half-life of a single plastic disposable cup. Additionally, plastic producers are fueling into this problem by adding ultraviolet stabilizers in plastic to increase its life expectancy. A major hazard for untreated plastic waste is the disintegration in micro plastics of plastic packages. Research has found that the toxic substances ingested during plastics production are absorbed into animal tissues that eventually contaminate the human food chain (UNEP, 2018).

### **Plastic industry in Bangladesh**

Plastic and plastic goods sector has emerged as an evolving sector in Bangladesh. The ever-growing

industry has exported USD 477 million the 2018-2019 fiscal years. The growth rate of the export (including deemed export) has increased to 21.8 percent per year between the 2013 and 2017. The added value of plastic products manufacturing ranges between 51 and 70%. The size of the domestic market of this plastic sector is not small. It stands for BDT 300 billion. This sector is described in the 7th Five Year Plan as a diversifying commodity and as a backward connection between the textile and light engineering industry. Earlier, exporting PVC bags (H.S. code 3923) and Plastic Waste (H.S. code 3915) were the key concern in Bangladesh (Islam, 2011). But, the export of these products started declining in recent times following Chinese government's ban on plastic waste import in 2018 as China is Bangladeshi plastics' primary export destination. However, there has been a significant development over the years in the export of many plastic products. This decrease in the plastic waste export will eventually contribute plastic pollution in the country. China, the UK, EU countries, the USA, Canada, etc. are the main export destinations of Bangladeshi plastics while KDS, DAF, RFL, Bengal, Partex, Talukdar, Unique and Anwar are the leading brands in plastic sector in Bangladesh (Hopewell *et al.*, 2011). The country is mainly producing low end products and the adaption of modern technology is not very noticeable. The manufacturers basically target capturing local markets. Bangladesh imports about 0.4 million tons of plastic raw materials per year while only 20 percent of them goes into plastic packaging.

### **Import and export scenario of plastic in Bangladesh**

The plastic industry has emerged as an important sub-sector in the Bangladesh economy. At present, its products have become an important part of the country's manufacturing sector. However, Bangladesh's plastic industry is totally reliant on imported raw materials since it has no polyolefin industry. At present, imported polymers and locally recycled plastic waste of about 750,000 tons are the main sources of the plastic consumption (Ahmed, 2011). According to a report, Bangladesh recycled around sixty percent post use plastics in 2010 and saved USD 600 million of virgin plastic (Bangladesh Waste Database, 2014). The amount of the imported plastic raw materials accounts for 0.26 percent of global imports, standing 59 in the world rank. The

key plastic suppliers of Bangladesh are China, Saudi Arabia, and Thailand.

### **Plastic all arounds Bangladesh**

In all its various types, Bangladesh is surrounded by plastic which are complex sets of substances. They differ in their strength, size, stiffness, and color, form, versatility and bending capabilities. Depending on the individual and their specified requirements, they may have various stretchabilities and extension and functionality capacities. Beginning from thin films, polythene derived perishable bags to bricks for roads and pillars and pipes for constructions, thick and large containers for holding water in households to chemicals in laboratories are made of plastics. The use of the different plastics also varies on purpose. One of the greatest uses of plastic is in the numerous shapes, sizes and hardness for the packaging industry over the Bangladesh. The use of plastic use has been increasing over the years rapidly with the expanding of home delivery, electronics shopping, worldwide imports and exports. With the increase of computer and digital revolution, the plastic use is also going to increment in a high volume (Derraik, 2002). Medical and health sectors also use plastic enormously as containers or packaging materials in packing tablet, liquid or gels, powders.

### **The three key phenomena regarding plastic**

The existing plastic problem that Bangladesh facing now is the consequent of three particular phenomena. The first phenomenon is the single use plastic which are non-biodegradable like shopping bags, which are thrown around and spread all over the Bangladesh. The second concern is that plastics are not recycled. However, most of the plastic materials can be, as report says, reprocessed through with appropriate and available technology. Bangladeshi people must need to give importance on quality recycling and come forward willingly to pay the accurate marketable price. The rest issue is our lack of awareness and indifference towards pollution. For example, in Scandinavian and Japanese cultures, people are much aware of the plastic pollution where Bangladeshi people are not aware like them.

### **Floating of plastic in the ocean**

The greatest concern is from one-time plastic which is cast off by single application as well as the multiple types and proportions of unrecycled

plastic products. These all find their ways in the water deposits, and finally in the seas, through canals and rivers (Strong, 2006). These intensive contaminations in ocean impacts and threatens all species of ocean of Bangladesh including marine fish. Eventually, these are entering into the human food chain. The tissues of the animals and aquatic species are found to have micro and nano-plastic, especially those substances which are below one millionth and billionth of one meter, posing serious health concerns.

### **Trans-boundary plastic pollution**

Being the lower end country, Bangladesh has to struggle with severe trans-boundary river pollution including plastic waste pollution. The country is bordered by India from three sides, Burma (Myanmar) from the southeast corner and the Bay of Bengal from the south. Three prime rivers of Asia have flowed throughout this country namely the Ganges, the *Brammaputra* and the *Meghna* River. All of the Trio Rivers joins with the Bay of Bengal at their end. Developing a tripartite understanding and agreement on how to decrease marine plastic and electronic contamination alongside different sorts of contamination in the three major river systems and subsequent pollution in Bay of Bengal is an issue of great concern and must be addressed urgently. Bangladesh needs to make it sure that the seasonality and the high variations of water flows in the trans-boundary rivers is incorporated properly.

### **Circular economy for tackling plastic pollution**

A new and creative solution to tackle plastic pollution is the circular economy which aims at eliminating waste and the continual use of resources. This innovative approach can contribute to maximize the benefits of plastic as well as abate their hazardous impacts on human health, environment, and ecosystems by manufacturing plastics from plants instead of fossil fuels, restructuring products to cut waste and make them last; promising recycling and reuse; and consuming plastic wastes as resources (Hossain, 2016). In general, the clean-up efforts are being attempted to tackle the existing. However, the only solution of this problem lies in addressing its root causes. These involve the prevailing "take, make, waste" linear economy driven by vast quantities of inexpensive, available energy and other commodities, and the development of disposable products ((Faruque,

2017). On the other hand, the main aim of the circular economy is to make use of resources as long as possible, extracting as much value from them as is practicable. It also aims to reintegrate and reproduced products and materials when they do reach the end of their lives. The key elements for local innovations, which could play a crucial role in the management of plastic pollution through circular economic approaches that might prove essential to long-term sustainable development, are technological improvements, investment and marketing (Creswell, 2014). In Bangladesh, especially in the big cities such as Dhaka, poor women and children collect and sell used plastic, those are thrown out or dumped outside roadside or under the open sky, to small enterprisesthat clean up the waste of plastics and package those to sell to the small industries for recycling.

#### **Legal aspects of plastics production and uses in Bangladesh**

Bangladesh has sets of environmental laws and acts for controlling ecological protection and pollution reduction. Regretfully, there is only one section of a particular act, out of the all environmental acts, assigned for plastic products. The section 6(A) of the Bangladesh Environmental Conservation Act (BECA) has the lone provision imposing prohibition on the manufacture, use and disposal of polythene bags that are only less than 55 microns thick while the rest are free to be produced consumed and disposed (Environmental Pollution Control Ordinance, 1977). The concerns about plastic pollution do not get mirrored without having a separate section of plastic. An instance can be quoted from acts regarding aquatic and terrestrial ecosystems; laws regarding water resources do not include any provision involving plastic cleaning in waterways, neither does it includes any fine for tourist spots polluters. As stated in the BECA 2002, any individual who breaks the law on polythene bag and consumes, produces, or markets polythene will be held liable and he has to pay Tk. 50000 as fine or will face one year of imprisonment. However, the Department of Environment (Bangladesh) could not enforce the laws regulated for producing, marketing and consuming polythene bags fully due to shortage of manpower. Though Bangladesh is the first country to endorse a law on polythene bags, the country is yet to get success in implementing and controlling polythene pollution. However, it is very optimistic that the judiciary

body of Bangladesh lately stated its concern on single-use plastic products in coastal areas, hotels, motels and restaurants across and the associated health and environmental hazards. Moreover, the High Court has also directed the authorities concerned to make it ensure that single use plastic products.

#### **Recommendations and conclusion**

It leaves no doubt that there will be increasing demands of plastic products and materials in Bangladesh in near future. Consequently, along with other pollutions plastic contamination will be a big challenge for Bangladesh in the upcoming days. However, this problem can be achieved through formation of a strong regularity body, promoting plastic waste segregation among the users and enhancement of the municipalities' capacity of collecting the maximum probable number of solid waste compared to the actual generation of solid waste. Emphasizes should be given on the awareness increasing activities for plastic waste segregation by consumers at all levels including individual, family, community and institutional levels. The Bangladesh government should come forward to encouraging the plastic industry and relative sectors for reprocessing, remanufacturing and reuses in order to ease the contamination. The public-private partnership (PPP) approach can be used to make the country's plastic industry and reprocessing of the used plastic materials modernized and formalized. The High Court of Bangladesh recent direction on the prohibition of the use of single use plastic can play a very vital role in reducing pollution. There is no alternative of effective legal actions and enforcement of the respective authorities to monitor the plastic manufacturing, recycling, trading, use and re-use and inevitably to minimize pollution for protecting the public health and environment. In lieu of reactive measures such as banning polythene use in early 2000 which failed, the Bangladesh government should also accept proactive measures in the management of plastic pollution with alternative and effective opportunities for trade, business and employment. Circular economy provides prospects for addressing plastic pollution through technological enhancement, local innovation and employment creation in Bangladesh. Being a lower riparian country, trans-boundary plastic contamination through river is a great dilemma for Bangladesh. The authorities

concerned should take actions necessary for holding discussion with the neighboring countries over plastic pollution and management in an urgent basis. Moreover, alongside the huge opportunity, technical and digital revolution has also posed serious threat to e-waste management and plastic pollution reduction.

With all the impediments and challenges, the plastic industry and innovation in Bangladesh should be treated as an opportunity. Though having a genuine green and clean plastic industry is a very difficult and challenging, Bangladesh can certainly develop a structure for greener and cleaner production of plastics, which may contribute to the country in achieving SDG 12. E-waste and plastic contamination management can provide Bangladesh with a new way for generating employments where women and poor communities of both urban and rural areas can get easy access to decent work, cleaner technologies and useful plastic with the minimize contamination effect. People all of ages of Bangladesh can contribute a vital role to make livable environment.

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