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# PLASTIC DEBRIS NEAR BURIGANGA RIVER BANK OF BANGLADESH – A NEW CONCERN FOR FISH, FISHING AND HUMAN HEALTH

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**ABSTRACT**

**Plastic pollution near rivers is of high concern because of its persistence in the environment and its potential impact on ecosystems. However, there is a specific lack of data in rivers of Bangladesh. Here we present data from the five different part of Buriganga river banks. Active sampling from each site was in quadrat of 1 $m^2$ located downstream in the estuary in a visual maximum along a 1 km shore covered by plastics. A total maximum 35 plastic debris items were individually counted from Zinzira, According to classified item and weight, load of plastic debris were zinzira>gabtoli>postogolla>fatulla>bosila respectively. It is obvious that last two or three decades, the quantity of plastic wastes has increased due to industrial and human activity near Buriganga river. Therefore, impact on fish biodiversity, fishing activity (clogging in net), and livelihood of local fisherman are affected. Thus, government intervention on illegal dumping of plastic waste, strict law implementation and awareness building among people become key concerns to save the Buriganga river from plastic pollution.**

**KEY WORDS :** Buriganga river, Plastic, Pollution, Fish biodiversity.

## INTRODUCTION

The discovery of plastics provided society with a material with almost limitless possibilities. Due to its beneficial characteristics (inexpensive, durable, lightweight, abundant, and can be produced in any desired shape), the popularity of plastics drastically increased during the 20th century and its production is still on the rise. Plastic is a synthetic material made from hydrocarbons that can be molded in solid objects of almost all shapes and sizes. Plastics including polyethylene and polypropylene (PP) are synthesized from olefins, while other plastics are synthesized from aromatic hydrocarbons, such as polystyrene (PS) and polyamide (PA) (nylon). Nowadays, the sectors using plastics are roughly divided in; packaging, building, transportation, electronics, textiles, safety and leisure. In 2017, an estimated 348 million tons of plastic was produced worldwide (Plastics Europe, 2018).

The Buriganga River is situated in the southern part of the north central region of Bangladesh and close to confluence to the padma and upper Meghna river. The river stream is influenced by some upstream rivers and canals like Jamuna, Turag, Karnatali, Dhaleswari and Tongikhal (Kibria *et al.,* 2015). The Buriganga River is a river in Bangladesh that ranks among the most polluted rivers in the country. It flows past the southwest outskirts of Dhaka city, the capital of Bangladesh. Its average depth is 7.6 meters (25 ft) and its maximum depth is 18 meters (58 ft) (Khan, 2005). More than 249 tanneries are situated on the Buriganga River's bank and most of these industries do not have any effluent treatment plants (Sarker, 2005). As a consequence, every day the river receives approximately 22,000$m^3$ of liquid waste containing different elements. Besides that, there are many

other sources such as industries like dyeing industry, fertilizer industry, workshops for aluminium, steel and iron, car repairing, production of battery, different pharmaceutical materials, hardware and cold storage units-which are responsible for adding 3,500 $m^3$ liquid wastes to the Buriganga's water per day (Gain *et al*., 1998; Khan, 2005; Hossain, 2005). According to Daily Star Magazine, Buriganga river receives around 9,000$m^3$ of untreated effluents in total from domestic and industrial sources per day. Plastic uses near river bank is very common due to more people intervention occur from business, main local port, fishing, industrial activities near river area etc. From many studies it is obvious that Buriganga river is one of the most polluted river in Bangladesh. Occurrence of heavy metal, industrial waste loading was focused in many studies. Thus along with all types of pollution illegal plastic dumping near river bank adding more stresses of that particular ecosystem but only few or no study was found on river plastic pollution to monitor the present situation.

Plastic waste started to accumulate in the natural environment; it became clear that plastic pollution can become an environmental hazard. As plastics are designed to last, inappropriately dispose plastic items remain in nature for a prolonged time (Andrady, 2013). Plastic pollution imposes threats on aquatic life, ecosystems, and human health (Derraik, 2002; Thompson *et al.,* 2004; 2009a; 2009b; Rochman *et al.,* 2015; Conchubhair *et al.,* 2019). Plastic litter can result in entanglement and ingestion by aquatic life such as turtles, birds, and fish, causing severe injuries and death (Gall and Thompson, 2015; Wilcox *et al*., 2015). Furthermore, plastic litter causes severe economic losses through damage to vessels and fishing gear, negative effects on the tourism industry, and increased shoreline cleaning efforts (McIlgorm *et al*., 2011). Most research efforts to quantify plastic pollution and its effects have focused on the marine environment (Blettler *et al*., 2018). Research on riverine plastic debris transport is a relatively young science and rare in Bangladesh. Buriganga fishes and freshwater habitat can be occupying significant position in the socio-economic of Dhaka cities by providing the population not only the nutrition but also income and employment opportunities with healthy environment. Therefore, present study is aimed to know macroplastic load along different part of Buriganga River and their possible impact on fish, fisheries and human health.

## METHODS AND MATERIALS

### Waste Damping near Buriganga

To evaluate the current situation of the Buriganga River, it is essential to understand the volume, variety and types of dumping in the river. The Buriganga is economically very important to Dhaka. Nearly 4.0 million people of the city are exposed to the consequences of water pollution every day. Launches and country boats provide connection to other parts of Bangladesh, a largely riverine country. The banks of the Buriganga were already a prime location for trade. The river was also the city's main source of drinking water but now this river is too polluted to use its water for drinking. The chemical waste of mills and factories, household waste, medical waste, sewage, dead animals, plastics, and oil are some of the Buriganga's pollutants. The city of Dhaka discharges about 4,500 tons of solid waste every day and most of it is released into the Buriganga. According to the Department of Environment, 21,600 cubic metres (5.7 million US gallons) of toxic waste are released into the river by the tanneries every day. Experts identified nine industrial areas in and around the capital city as the primary sources of river pollution: Tongi, Tejgaon, Hazaribagh, Tarabo, Narayanganj, Savar, Gazipur, Dhaka Export Processing Zone and Ghorashal. Most of the industrial units of these areas have no sewage treatment or effluent treatment plants (ETPs) of their own. More than 60,000 cubic metres (2,100,000 cu ft) of toxic waste, including textile dyeing, printing, washing and pharmaceuticals, are released into the main water bodies of Dhaka every day (*Leather International, Global Trade Media, 2002;* Human Rights Watch, 2012; *Aulakh and Raveena, 2013)*. According to the Dhaka Water and Sewerage Authority (WASA), about 12,000 cubic metres (420,000 cu ft) of untreated waste are released into the lake. Moreover, every day a huge amount of domestic waste from the entire from locality of Gazipur to Munshiganj district has discharged into the Turag-Buriganga River system. The river banks between Kamrangir Char Bridge and the second Buriganga Bridge, is another hot spot where tons of waste are dumped directly into the river every day.

### Selecting sampling area

Samples were collected from five significant points from Buriganga river. Keeping Sadarghat as middle point because of it's importance as main port for local water transportation and maximum human

activity takes place here in Bangladesh. Two close location were selected; one Zinzira point and other Postogola bridge which was 4 km and 5.6 km away from both side of Sadarghat. Beginning and ending point was Gabtoli and Fatulla respectively (Fig. 1).

**Sampling method**

Plastic materials were exhaustively collected by hands in a quadrat of 1 $m^2$ in a visual maximum of plastic accumulation until the soil was reached. Samples were stored in big plastic bags. They were dried at ambient air for days, then sorted and counted one by one in the lab, classified by size and category and weighted (Tramoy *et al.*, 2019).

## RESULTS

**Site 1: Gabtoli**

This is the beginning point of Buriganga river. Karnatali river and Turag khal met at this point and form Buriganga river which run alongside Dhaka, the capital of Bangladesh. This place contains cement factory, brick field and cattle market. Cement and Brick are carried by trawler and under privilege people live around here. So human intervention near this place is very active. Fishing take place in here but not much focused. Gabtoli is one of the busiest bus terminals in this country. Aminbazar bridge crosses over Buriganga river. Most of the plastic item found were related to the activities occurred nearby (Table 1).

**Site 2*:* Bosila bridge to Hazaribagh**

Hazaribagh is highly densed area of Dhaka city near Buriganga. Eastern side of Buriganga is compiled with residents and on the other side of the river residential building is on construction. Residential waste dumps on the bank of the river in every 40m diameter on eastern side. Most terrific part is drainage system from the residential area open up into the river (Table 2).

**Site 3: Zinzira**

The town of keraniganj stands on the southwest side of Dhaka city on the bank of the Buriganga river. This is the midpoint of Buriganga river. which run along side Dhaka, the capital of Bangladesh. From Keraniganj to Zinzira on the bank of the river Buriganga section approximately 3.9km, most of the plastic material found in river is used for household and commercial purposes. Plastic wastes at the shop along the river, by the passenger on the river mixing directly into the river water. This place contains furniture factory, shopping market, iron tool's factory. This part of the river is also used as the way of travels from Dhaka to Barishal, Khulna division. Industrial products are carried by trawler and under privilege people live around here. So human and river interaction is very active in this place. Fishing take place in here but in very little quantity because actual fisherman doesn't rely on this. Still Zinzira is one of the busiest boat stations. Dhaka city and Keranigonj are connected by few bridges cross over Buriganga river. In data sheet we can clearly see

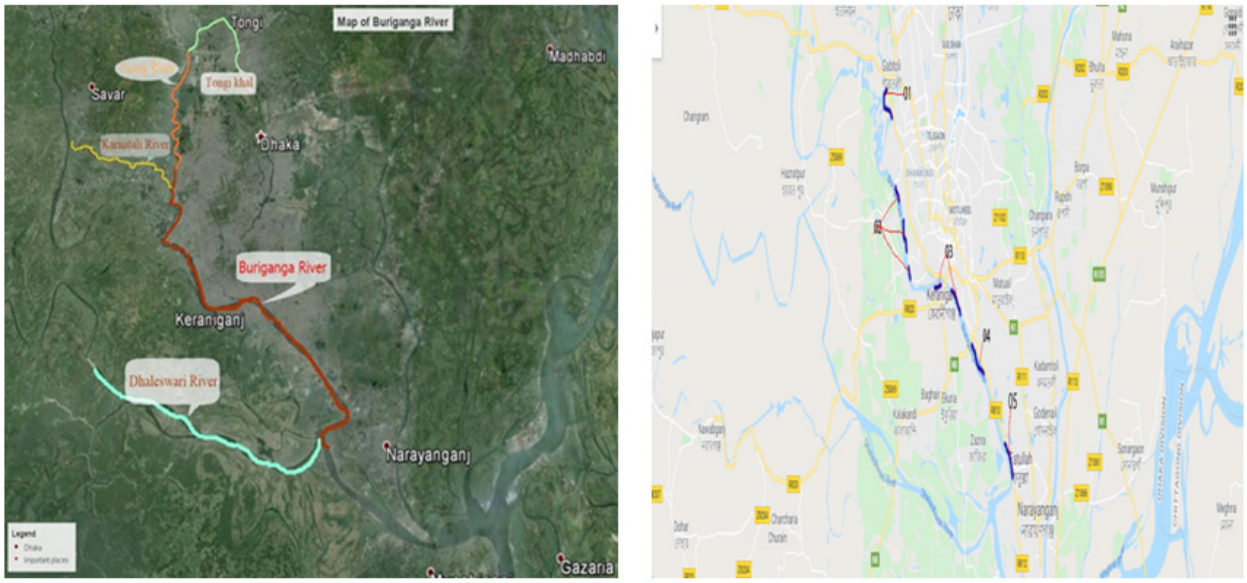


**Fig. 1.** Map of Study area

human contribution to the river is very harsh (Table 3).

**Site 4: Postogola**

It is one of the busiest areas of Buriganga. It's a route of public transportation.During previous and current assessment of water quality of the postogola different point and non-point plastic pollution sources have been identified. Plastic pollutants are mainly generated in and around the city through domestic, commercial and industrial activities. Solid wastes are collected by the city corporation and dumped on the open land. This solid wastes drop into river by washing of rain water. In addition, the least expensive method of municipal plastic disposal practiced along many residents is to place it on the streets. Part of this waste ultimately finds its way into the rivers through rainwater runoff's a whole, solid microplastic in Dhaka City is considered one of the major points of source of plastic to the Postogola River areas (Table 4).

**Site 5: Fatullah**

In Narayanganj City of Bangladesh, like in other developing countries, the plastic materials discarded are usually regarded as a municipal liability. This includes household plastic waste commercial plastic waste, basin and drain cleaning plastic wastes, bulky plastic wastes, includes food preparation, shopping and gardening plastic wastes. Commercial plastic are the wastes that come from stores, offices, restaurants, warehouse and hotels. These plastic wastes usually comprise packing and contain food (Table 5).

**Types of Plastic**

According to secondary data list, data from present study revealed that almost all (100%) the product come from house hold use (Table 6). Most of the plastic are coming from commercial packaging items which could be categorized as type of polyethylene, polypropylene, polyethylene terephthalate,

**Table 1.** Plastic items from near Gabtoli point of Buriganga River, Dhaka, Bangladesh.

| | | **Place: Gabtoli** | |
|---|---|---|---|
| Serial no. | Name of collected sample | Net Weight (g)/645 g | Percentages (%) of total weight |
| 1 | Portion of Cement bag | 9.7 | 2 |
| 2 | Plastic banner | 17.98 | 3 |
| 3 | Dish cable | 19.42 | 3 |
| 4 | Scotch tape | 1.93 | 0.29 |
| 5 | Food box | 5.71 | 1 |
| 6 | Normal white polythene | 5.08 | 1 |
| 7 | Biscuit packet | 2.43 | 0.37 |
| 8 | Normal blue polythene | 3.69 | 1 |
| 9 | Pot of Rose water | 8.04 | 1 |
| 10 | Saline packet | 2.29 | 0.35 |
| 11 | Peel of soft drink bottle | 0.65 | 0.10 |
| 12 | Plastic water bottle | 20.7 | 3 |
| 13 | Hair oil bottle | 20.63 | 3 |
| 14 | Sole of ship/ refrigerator | 23.19 | 4 |
| 15 | Liquid Hand wash packet | 0.86 | 0.13 |
| 16 | Rubber sandal | 133.5 | 21 |
| 17 | Chocolate's aluminium foil | 3.9 | 1 |
| 18 | Medicine cover | 3.6 | 1 |
| 19 | Tang packet | 5.64 | 1 |
| 20 | Jar of Mobil | 224.87 | 35 |
| 21 | Biscuit's sole box | 2.65 | 0.41 |
| 22 | Normal sole | 6.8 | 1 |
| 23 | Plastic mug | 39.79 | 6 |
| 24 | Empty plastic pot | 12.83 | 2 |
| 25 | Soap packet | 2.26 | 0.35 |
| 26 | Chips packet | 5.88 | 1 |
| 27 | Face wash cover | 22.92 | 4 |
| 28 | Light Bulb socket | 31.26 | 5 |

**Table 2.** Plastic items from near Bosila bridge to Hazaribagh of Buriganga River, Dhaka, Bangladesh.

| | Place: Bosila bridge to Hazaribagh | | |
|---|---|---|---|
| Serial no. | Name of collected sample | Net Weight (g)/ 174 g | Percentages (%) of total weight |
| 1 | Plastic cement bag | 69.94 | 40 |
| 2 | Washing powder packet | 22.33 | 13 |
| 3 | Saline packet | 2.59 | 1 |
| 4 | Shemai packet | 14.6 | 8 |
| 5 | Cork sheet piece | 0.91 | 1 |
| 6 | White Polythine | 12.41 | 7 |
| 7 | Plastic veil | 14.1 | 8 |
| 8 | Yogurt lid | 1.8 | 1 |
| 9 | Vermilion pot | 9.92 | 6 |
| 10 | Biscuit packet | 7.37 | 4 |
| 11 | Plastic musk | 2.7 | 2 |
| 12 | Plastic comb | 12.91 | 7 |
| 13 | Shampoo packet | 1.3 | 1 |
| 14 | Cap of oil bottle | 1.12 | 1 |

expanded polystyrene.

## DISCUSSION

One of the most recent and important effects of plastic pollution is bio-accumulation of plastic inside animals. Harmful chemicals are released by these accumulated plastic wastes and also break down into small pieces which cause adverse effect on the animals. Even after their death, those plastic wastes remain present in the marine environment. Sometimes these plastic wastes gets stuck on fishing gear and crafts which is very harmful for fishing activity too. Extravagant dumping of plastic wastes has created countless negative impacts on the ecosystem of the Buriganga River. Many people wash shredded plastic in the river and dry it on the embankment of the river in Tanki Bazar Ghat area, around 300 yards west of Shwarighat. In both cases, thousands of micro plastics are mixing with the

**Table 3.** Plastic items from near Zinzira point of Buriganga River, Dhaka, Bangladesh.

| | Place : Zinzira | | |
|---|---|---|---|
| Serial no. | Name of collected Sample | Net weight (g)/ 860 g | Percentages (%) of total weight |
| 1 | Salt packet | 8.22 | 1 |
| 2 | Aluminum foil | 73.38 | 9 |
| 3 | Plastic pot of tobacco | 3 | 0.34 |
| 4 | White plastic sheet | 5.19 | 1 |
| 5 | Pink plastic sheet | 1.81 | 0.21 |
| 6 | Green polythyne | 8.21 | 1 |
| 7 | White polythyne | 3.4 | 0.39 |
| 8 | Blue polythine | 10.21 | 1 |
| 9 | Chips packet | 6.63 | 1 |
| 10 | Noodles packet | 15.9 | 2 |
| 11 | Biscuit packet | 5.69 | 1 |
| 12 | Medicine cover | 5.06 | 1 |
| 13 | Plastic case of beauty cream | 21.16 | 2 |
| 14 | Packet of energy biscuit | 20.85 | 2 |
| 15 | Bottle of syrup | 14.21 | 2 |
| 16 | Packet of powder milk | 2.39 | 0.27 |
| 17 | Commercial packaging of Dairy product | 37.38 | 4 |
| 18 | Cork | 58.53 | 7 |
| 19 | Rubber slipper | 199.47 | 23 |

**Table 3.** *Continued ...*

| | Place : Zinzira | | |
|---|---|---|---|
| Serial no. | Name of collected Sample | Net weight (g)/ 860 g | Percentages (%) of total weight |
| 20 | Sole of Footwear | 99.5 | 12 |
| 21 | Sole of Refrigerator/ Ship | 130.44 | 15 |
| 22 | Plastic tea cup | 3.6 | 0.41 |
| 23 | Chocolate packet | 1.51 | 0.18 |
| 24 | Shampoo packet | 1.14 | 0.13 |
| 25 | Water bottle | 33.26 | 4 |
| 26 | Plastic jar of eye drop | 4.25 | 0.49 |
| 27 | Drinking straw | 0.8 | 0.09 |
| 28 | Plastic red rope | 3.03 | 0.35 |
| 29 | Plastic blue rope | 1.44 | 0.16 |
| 30 | Syringe | 2.57 | 0.29 |
| 31 | Net bag | 5.26 | 1 |
| 32 | Tobacco packet | 0.4 | 0.05 |
| 33 | Plastic green wire | 2.13 | 0.27 |
| 34 | Plastic lighter | 9.26 | 1 |
| 35 | Plastic pen | 5.48 | 1 |
| 36 | Plastic switch | 18.07 | 2 |
| 37 | Cosmetics bottle | 25.5 | 3 |
| 38 | One time food box | 5.13 | 1 |
| 39 | Chocolate packet | 5.98 | 1 |

**Table 4.** Plastic items from near Postogola point of Buriganga River, Dhaka, Bangladesh.

| | Place : Postogola | | |
|---|---|---|---|
| Serial no. | Name of collected Sample | Net weight(g)/ 860 g | Percentages (%) of total weight |
| 1 | Piece of Scotch tape | 0.65 | 0.41 |
| 2 | Polythene used for fruit packaging | 0.78 | 0.48 |
| 3 | Cork | 1.03 | 1 |
| 4 | Plastic Cover for commercial packaging | 0.76 | 0.46 |
| 5 | Soft drink bottle | 2.45 | 2 |
| 6 | Plastic Sheet | 6.07 | 4 |
| 7 | Plastic jar | 7.32 | 5 |
| 8 | Plastic Slipper | 15.5 | 10 |
| 9 | Baloon | 1.94 | 1 |
| 10 | Plastic rope | 4.16 | 3 |
| 11 | Cover of medicine | 1.99 | 1 |
| 12 | Plastic hanger | 3.79 | 2 |
| 13 | Plastic cup | 2.12 | 1 |
| 14 | Pink sheet | 6.26 | 4 |
| 15 | Plastic pen | 4.71 | 3 |
| 16 | Cement bag | 14.75 | 9 |
| 17 | Plastic toy | 4.84 | 3 |
| 18 | Plastic Gas Lighter | 13.25 | 8 |
| 19 | Plastic pot for commercial packaging | 5.7 | 4 |
| 20 | Condom | 1.83 | 1 |
| 21 | Cosmetics Jar | 10.61 | 7 |
| 22 | Strew | 0.26 | 0.12 |
| 23 | Cotton bud | 0.14 | 0.09 |
| 24 | Brush | 9.91 | 6 |
| 25 | Rubber belt | 0.27 | 0.17 |
| 26 | Jar of Deodorant spray | 40.91 | 25 |

**Table 5.** Plastic items from near Fatullah point of Buriganga River, Dhaka, Bangladesh.

| Serial no. | Place: fatullah<br>Name of collected sample | Net weight (g)/ 108 g | Percentages (%) of total weight |
|---|---|---|---|
| 1 | Plastic Slipper | 18.19 | 17 |
| 2 | Plastic bottle | 21.35 | 20 |
| 3 | Plastic cover of tobacco packet | 0.28 | 0.26 |
| 4 | Piece of Plastic bag of Rice | 2.78 | 3 |
| 5 | Packet for commercial pakaging | 20.96 | 19 |
| 6 | Plastic table cloth | 3.8 | 4 |
| 7 | Plastic bag | 10.39 | 10 |
| 8 | X-Ray sheet | 7.46 | 7 |
| 9 | Cork sheet | 0.81 | 1 |
| 10 | Salt packet | 0.45 | 0.42 |
| 11 | Plastic spoon | 1.12 | 1 |
| 12 | Plastic net | 2.41 | 2 |
| 13 | Aluminum foil | 1.45 | 1 |
| 14 | Plastic rope | 4.68 | 4 |
| 15 | Cosmetics jar | 7.18 | 7 |
| 16 | Rubber | 1.46 | 1 |
| 17 | Hard foam | 3.23 | 3 |

**Table 6.** Data on common plastic polymer types and their density

| Polymer | Abbreviation | Density ($g/cm^3$) Min | Max | Main application |
|---|---|---|---|---|
| Polyethylene | PE | 0.90 | 0.97 | Packaging |
| Polypropylene | PP | 0.9 | 0.91 | Many application, but mainly packaging |
| Polyester | PES | 1.24 | 2.3 | Textiles |
| Polyethylene terephthalate | PS | 1.37 | 1.45 | Packaging |
| Polystyrene | PS | 1.01 | 1.04 | Packaging |
| Expanded polystyrene | EPS | 0.016 | 0.640 | Food packaging, construction material |
| Ethylene vinylacetate | EVA | 0.92 | 0.94 | Others |
| Alkyd | Al | 1.67 | 2.1 | Paints, fibers |
| Polyvinyl chloride | PVC | 1.16 | 1.58 | Building and construction |
| Polymethyl methacrylate | PMMA | 1.17 | 1.2 | Electronics (touch screens) |
| Polyamide (nylon) | PA | 1.02 | 1.05 | Automotive, textiles |
| Polyacryloritrile | PAN | 1.09 | 1.2 | Textiles |
| Polyvinyl alcohol | PVOH | 1.19 | 1.31 | Textiles |
| Acrylonitrile butadiene styrene | ABS | 1.06 | 1.08 | Electronics |
| Polyurethane | PUR | 0.03 | 0.1 | Building and construction |

Source: Schwarz *et al.* (2019) and Plastics Europe (2018)

waters of the river every day (News: Indiscriminate waste dumping continues in Buriganga, Dhaka Tribune, 2020).

Previously, many native fish species such as Rui (*Labeo rohita*), Katla (*Catla catla*), Mrigal (*Cirrhinus cirrhosus*), Kajuli (*Ailiacoila*), Mola (*Amblypharyngodon microlepis*), Raj Puti (*Barbonymus gonionotus*), Tangra (*Batasio tengana*), Koi (*Anabas testudineus*), Gojar (*Channa marulius*), Taki (*Channa punctata*), Shol (*Channa striata*), Grass cup (*Ctenopharyngodon idella*), Chabli (*Devario aequipinnatus*), Chapila (*Gonialosa manmina*), Bata (*Labeo bata*), Khoil (*Colisa fasciata*), Batashi (*Neotropius atherinoides*), Pabda (*Ompok pabo*), Pangas (*Pangasius pangasius*), Rita (*Rita rita*), Potka (*Tetraodon fluviatilis*), Boal (*Wallago attu*), and Kakila (*Xenentodon cancila*) were available at a large amount in the Buriganga River. At this present time, dumping of plastic waste is increasing, many of those fish species are about to extinct. The pollution level in the Buriganga River is

higher than any other rivers in Bangladesh (Rahman, 2011)

Once in the environment, the fate of plastics varies by a plastic's properties. Travel distances, likelihood of accumulation, and degradation rate may vary considerably between plastic polymer and item types. Polymer identification is critical to develop expectations of a plastic's fate and effect due to its properties. For example, density affects the extend of transportation in aquatic environments (Schwarz *et al.,* 2019). Additionally, also shape of plastics strongly affects exposed surface area, which can be important for transportation processes and chemical leakage (Schwarz *et al.,* 2019). Shape groups observed in previous studies are the hard plastics (solid pieces), pellets (pre production), films (thin layered), and fibers (elongated lines) (Eriksen *et al.,* 2013; Free *et al.,* 2014). Therefore it is clear from present study that among the identified plastics near river bank, most of them were used for packaging (food item, cosmetics, industry), single used plastic materials. Contamination type was based on the activity of that particular spot.

Bangladesh to become the first country in the world to ban plastic bags in 2002 (Giacovelli, 2018) but over the last few decades, the plastics industry has become an important sector in Bangladesh (Afrooz, 2016). In Bangladesh, the amount of plastic waste generated in a day is greater than the amount of plastic waste generated in a month by some countries (Shimo, 2014) Bangladesh generates 821,250 tonnes of plastic wastes in its urban hubs each year and 207,685 tonnes are dumped in the Bay of Bengal**.** Bangladesh produces around 87,000 tonnes of single-use plastics waste annually and 86% of the waste is dumped in landfills. (Single Use Plastic: Hidden Costs of Health and Environment in Bangladesh – *Environment and Social Development Organization)* (Haque *et al.,* 2017).

Present study revealed that due to improper waste management, much people intervention for transportation, fishing, local business, many industrial activities near river area, Zinzira point was one of the largest hotspots of plastic pollution rather than any other point of Buriganga River. Thus this study suggest that proper law implementation, awareness building and regular monitoring could help to retrieve the fish and fisherman of that area as well as for other aquatic organism and human health.

## CONCLUSION

Most plastics are durable and degrade very slowly, as their chemical structure renders them resistant to many natural processes of degradation. Plastic waste left behind after bathing and washing utensils and clothes at the river bank e.g. shampoo packet, detergent packet etc. also directly mixing into river water. Again, the broken pieces of the cork sheet box used by the fisherman to preserve fish are mixing with river water. The abandoned rubber and plastic sandals of passengers on the river, fisherman, boatman and people around the river, also mixes with river water. Also, abandoned plastic waste used in dwellings e.g. salt packet, green, white and blue polythene, noodles packet, switch, wire, beauty cream case, plastic rope, net bag, pen, milk packet, syringe, medicine cover, eye drop etc. are dumped directly into river water after being dumped on the river bank. Thus, plastic contamination near river bank is a great threat for fish health, clogging in fishing gear and crafts and ultimate risk for human health as well. Therefore, combined immediate (government, policymaker and industrialist) intervention and monitoring are mandatory to save ecosystem of that particular area as well as mitigating issues related to human health.

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