

ENVIRONMENTAL DISASTER FROM ABANDONED CORONAVIRUS FACE-MASKS IN BANGLADESH: LIVE AND LET LIVE

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ABSTRACT

The new norm to fight the Coronavirus (SARS-CoV-2) is to keep social distancing, washing hands regularly, and wearing face masks in public places. Like other countries, the single used surgical face mask is used as primary personal protective equipment (PPE) by the Bangladeshi people to control the spread. In Bangladesh, the number of monthly harvested masks waste was 1592 tonnes during 2020 and the total quantity of waste was estimated at 14500 tonnes. As there exists no effective policy or regulation in Bangladesh for the management of waste, the huge disposal of surgical masks is going to damage the environment on a larger scale. Microplastics (MPs) of the surgical face masks are causing environmental pollution and imposing a great threat to human health as well as the aquatic environment. With increasing reports on inappropriate disposal of masks, it is urgent to recognize this potential environmental threat and prevent it from becoming the next plastic problem. The primary aim of this paper is to find the root cause of the pollution and to measure the extent of it by assessing the effect of the pollution on the environment. The last part of the paper has emphasized the loopholes in the existing legal frameworks and has provided some socio-legal recommendations to mitigate pollution.

KEY WORDS : Covid Waste, Environmental pollution, Abandoned Face-masks, Microplastics pollution

INTRODUCTION

The outbreak of the latest flu Coronavirus (SARS-CoV-2) has immobilized the normal affairs of public life around the globe from 2020 to the present (Zhou *et al.*, 2020). The new normal to fight this pandemic is to keep social distancing, washing hands regularly, and wearing face masks in public places (Ngonghala *et al.*, 2020). It is a matter of great concern that disposable face masks are produced from micro-sized plastic fibers (thickness of ~1 to 10 micrometers) which released more micro-sized plastics similar to plastic bags. Among the list of "Covid waste", single-use face masks and hand gloves are indexed as the vital sources of microplastics (Aragaw, 2020). The disposable masks cannot be readily biodegraded as they are plastic products and for the lack of any guidelines for mask recycling, a new problem is increasing from the

microplastics (MPs) during the process of waste degradation. The face masks are adding microplastic pollution as generally, it contains either polypropylene and/or polyurethane, polyethylene, polyacrylonitrile, polystyrene, polypropylene, etc. (Akber *et al.*, 2020). In Bangladesh, the microplastics (MPs) are disposed of as solid waste as it is not like general plastic products (of which app. 25 pct. is recycled) and there is no appropriate guideline for recycling. Microplastics (MPs) are causing environmental pollution and imposing a great threat to human health as well as the aquatic environment. These products are sold in plastic packages which is additionally causing plastic pollution. All the cities of Bangladesh annually produced almost 0.82 million tonnes of plastic wastes and almost 0.21 million tons are thrown away in the internal water. In comparison to the previous five years' data, in 2020 and 2019, the rate of plastic waste has

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increased to 18 times higher (Waste Concern, 2020). This alarming situation has coerced the High Court Division of Bangladesh to issue an order directing the government to take initiative for prohibiting the use of single-use plastic products in coastal areas and establishments (Holy, 2020). The careless and unprofessional disposing of single-use face masks by individuals or organizations are entering into the internal watercourses, sometimes directly and sometimes indirectly through the city or municipal sewerage lines. According to the World Health Organization (WHO), only health professionals around the world used approximately 89 million face masks annually, and the complete usage figure is almost 130 billion (Prata et al., 2020). We can't deny the significant role of face masks to tackle the pandemic but a new height of environmental pollution is threatening the life of humans and animals. It is high time to stop this pollution both by creating social awareness and by formulating strengthen regulations.

FINDING THE CAUSE AND MEASURING THE EXTENT OF THE POLLUTION

The Government of Bangladesh declared a nationwide lockdown from March 26, 2020. In a developing country like Bangladesh, it was nearly impossible to maintain interpersonal distance in many parts of Bangladesh, and it was difficult to persuade people to stay at home, especially in the capital Dhaka, which is a megacity (Ahmed and Yunus, 2020). It was nearly impossible to raise awareness at the same time among the approximately 1.1 million slum dwellers situated near Dhaka city (Anwar et al., 2020). Masking the face in public places became mandatory and enforced as a preventive non-pharmaceutical solution to limit the spread of the virus with the decision to ease so-called lockdown, except in the education sector, in late May (Ahmed and Yunus, 2020). People in Bangladesh became very anxious and concerned as the COVID-19 mortality rate increased around the world (Islam et al., 2020). The increasing global infection rate resulted in the widespread use of face masks publicly before April but when the lockdown was lifted from late July, the usage rate decreased. The second wave of Covid hit Bangladesh from the end of February 2021 and people start using masks again due to the strong position of the law enforcement agencies. As there is no waste management mechanism available

presently in Bangladesh, the incautious disposal of covid waste, especially single used face masks, has imposed an unforeseen social threat. Almost 160 million Bangladeshi people consumed almost 2.65 billion masks monthly. The number of monthly harvested masks waste was 1592 tonnes during 2020 and the total quantity of waste was estimated at 14500 tonnes (Rahman et al., 2020). As there exists no effective policy or regulation in Bangladesh for the management of waste, the huge disposal of surgical masks is going to damage the environment on a larger scale.

EFFECT OF THE POLLUTION ON ENVIRONMENT

Previous research data show that around the world, 18% of plastics wastes are reused, 24% are burned and 58% are either landfilled or discover their way into the oceanic environment (Geyer et al., 2017). This scenario is also similar in Bangladesh regarding the management of Covid waste, especially in the case of surgical masks. The plastic components of a surgical mask never get decomposed completely but only their shape changed into smaller particles. After a very short travel, these small particles make contact with the human body. Toxic gases are released after burning these particles and approximately 3223 microparticles are inhaled annually by children and adults (Sharareh et al., 2017). In comparison to the terrestrial environment, the aquatic environment is more hampered by the erroneous disposal of surgical masks. For the limited photooxidation and decreased light intensity capacity of a surgical mask, the degradation rate is slow in comparison to similar components (Lattin et al., 2004). Microplastics (MPs) have been discovered in the gut of different aquatic organisms by researchers previously (Teuten et al., 2007). Even it has been traced by the researchers in the stomach of several commercial fishes (Adeogun et al., 2020). The predatory birds are transmitting the microplastics (MPs) back to the terrestrial ecosystem and sometimes humans are consuming it through seafood (Eerkes-Medrano et al., 2015). Masks floating in rivers and lakes will initially dominate the surface area for a short period before settling down on the floor of the fluvial habitats. aquatic organisms of the water bed are attracted by the face masks color and periphyton and plankton start growing inside the mask. Several fishes, mammals, birds, and reptiles inevitably become entangled in

and may consume, the soaked face masks (Caron *et al.*, 2018; Castro-Jiménez *et al.*, 2019; Gall and Thompson, 2015). Face masks could create swimming obstacles of the large and small aqua species, also it could cause sudden suffocation by clogging their respiratory systems (Kögel *et al.*, 2020). Biofilm formation in the plastisphere by the plastic particles could deteriorate the water and soil quality (Kirstein *et al.*, 2019).

EXISTING LEGAL FRAMEWORK AGAINST THE POLLUTION

A single-use surgical mask is a medical waste as well as due to the nature of the components, it is also considered a plastic product. The Bangladeshi law has restricted the manufacturing, using, or disposing of polythene bags that are less than 55 microns thick but other variants could be produced without any prohibition under Rule 6ka of Clause-5 under Section-9 of the Bangladesh Environmental Conservation Act (BECA), which was revised in 2002 (The Bangladesh Environment Conservation Act, 1995). In case of non-compliance with the provision, penalty and punishment have been provided. In the case of production, import, and marketing the punishment could be extended upto 10 years rigorous imprisonment or fine upto 1 million takas, or both punishment. In case of selling, exhibiting, storing, distributing, transporting, or using for commercial purposes, the punishment could be extended upto 6 months rigorous imprisonment or fine upto 10 thousand takas, or both punishment.s The waste disposal of different hospitals and medical institutions are regulated by the Bangladesh Medical Waste Management and Processing Rules 2008. This rule is for the management of institutional waste management but when particular medical equipment is used by the public on a large scale, the individual responsibility is not defined by it. That is because this is the first time in Bangladesh as well as around the whole world, surgical masks, which are medical equipment are using by the public in such a huge quantity and on regular basis. Section 269 of the Penal Code 1860 of Bangladesh might be relatable with remote interpretation. According to the section “any person who neglectfully or illegally does any act, which may cause the outbreak of contagious disease and harm public health shall be punished with 6 months imprisonment or fine or both” (The Penal Code, 1860). The Medical Waste Management

and Processing Rules, under Rule 8 has devices for the establishment of dumping zones in seven division (The Bangladesh Medical Waste Management and Processing Rules, 2008). It is a matter of great concern there exists only one specialized dumping ground in Dhaka and which is not sufficient for the hospitals and medical institutions inside the city. Although Rule no. 3 prescribes the establishment of seven divisional authorities in 7 divisions of Bangladesh for monitoring the management and disposal of medical wastes. The Rule prescribed to establish such divisional authorities within three months from the enactment of the Rules but even after 11 years of enactment, these divisional authorities haven't formed yet. Due to a shortage of manpower, the Department of Environment failed to enforce the laws regulated for producing, marketing, and consuming polythene bags. This alarming situation has coerced the High Court Division of Bangladesh to issue an order directing the government to take initiative for prohibiting the use of single-use plastic products in coastal areas and establishments in 2020 (Holy, 2020).

SOCIO-LEGAL RECOMMENDATION

The environmental pollution caused by the plastic polymers in face masks, directly and indirectly, harming the entire creature by polluting the whole environment. It will be very difficult for Bangladesh to achieve the sustainable development goal set by the United Nations to “Ensure a poverty and pollution-free peaceful planet Earth by 2030” without controlling the production of plastic-based Covid equipment and proper waste management guidelines. The following recommendations are made to address this global issue sustainably:

- The sustainable alternatives of plastic polymers based face masks are the “eco-friendly” 3D filament, green polymers, or wood fibers
- For the general public, using reusable cloth masks is cost-friendly, effective to stop the spread, and also environment friendly
- Awareness should be made among the consumers for household disposal of the masks. Level of warning should be included both package and on the mask for safety disposal
- The Bangladesh Environment Conservation Act, 1995 should be revised based on the changing needs and necessity of the society for using or disposing of polythene based products during an

emergency or global crisis

- In the case of surgical mask recycling, precaution should be taken to stop the possibility of COVID-19 transmit among the workers by using in a sealed or leak-proof container
- The Government should develop an effective waste management strategy framework for safeguarding the environment by reducing and recycling plastic waste
- The Bangladesh Medical Waste Management and Processing Rules, 2008 should be revised to declare the individual responsibility while disposing of both medical waste (hazardous waste) and normal waste (non-hazardous waste)
- The prescribed divisional authorities under the Bangladesh Medical Waste Management and Processing Rules, 2008 must be established as soon as possible. To address the unknown but foreseeable hazard, protected disposal zones must be established.

CONCLUSION

Due to the lack of an alternative solution of the single used surgical face masks, plastic gloves, and hand sanitizers; the current pandemic situation has made it difficult for us to make a conscious choice. As there are no other effective options, from now on we have to be aware while using and disposing of this plastic-based equipment. The crucial gaps in Bangladesh's structural system have been highlighted due to the global pandemic and the future challenges for us will be to manage the anomalous amount of Covid based plastic waste. Without developing an effective waste management strategy framework for safeguarding the environment, informal sector workers will be vulnerable to can further health risks. The aquatic environment of the country is getting heavily polluted by facial mask pollution and the ecosystem is being destroyed drastically. Urgent government action is required to prevent long-term health hazards and environmental degradation. Personal protective equipment (PPE) is used and disposed of by several stakeholders like medical personal, malls, factories, local markets, and shops. An effective and practical guideline is required to be formulated after consulting with the experts, development actors, and stakeholders. Formulation of strict guidelines is not enough but strict monitoring is also required to implement the mechanism. For this purpose, the involvement of the law enforcement agencies and

local authorities will be fruitful. The role of the media is significant to create awareness among the general public and the young generation can play a vital role here through social media platforms. If we could engage the youths in the waste disposal monitoring process at the community level, we can stop the pollution more effectively. Not least of all, for the management of Covid-19 wastes nationally and to prevent further degradation of the environment, a specially trained taskforce is the demand of time.

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