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# A Crisis amidst Crisis: Analyzing The Environmental Repercussions of Rising Bio-Medical Waste in the Post-Pandemic Era and Its Remediation Strategies

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## ABSTRACT

*Bio-medical waste and its impact on environment never received so much attention as it is receiving now, the virus has poised itself as a catalyst to economic, societal and environmental deterioration. The hospitals are indispensable and the life-saving character of medical instrument's cannot be denied, but when they are dumped without proper treatment it's ecotoxicological effects cannot be overlooked. On one hand the world is trying to recover from the pandemic without realising that they are paving way for another. As of today, the bio-medical waste is the flagbearer of exacerbating plastic pollution. Lives are at stake but should it be saved at the cost of our environment or are there more efficient ways to address these issues? This research paper aims to provide an overview on the impact of rising bio-medical waste in environment and the need for remediation strategies and judicial management of the bio-medical waste.*

## I. INTRODUCTION

Bio-medical waste is defined as any type of waste created during a diagnostic process, the treatment of a condition or disease, or immunizations of humans or animals. It also includes any research activities or processes that involve biological testing. In essence, it's any type of waste that contains any type of material that may be contaminated with potentially infectious properties. Infectious properties can be found in syringes delivering medications. They can be found in bedding, masks, bandages, or clothing contaminated with blood or bodily fluids of a person infected with a communicable disease.<sup>2</sup> The onset of SARS-CoV-2 virus has made the use of disposable masks (N95 masks or surgical masks) inevitable. A staggering 129 billion disposable face masks and 65 billion plastic gloves are estimated to be used globally every

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<sup>2</sup> Govt of India. Ministry of Environment and Forest Gazette notification No 460 dated July 27, New Delhi. 1998: 10-20.

month and have become a visible manifestation of a new normal.<sup>3</sup> As per a joint report by Associated Chambers of Commerce and Industry of India (Assocham) and Velocity in 2018, the total quantity of medical waste generated in India (in 2018) was 550 TPD, and these figures are likely to increase close to 775.5 TPD by 2022.<sup>4</sup> This was the pre-covid predictions, now the figures are going to be double the calculated amount.

Bio-Medical waste is classified into four categories -

- 1) General Waste- Also known as residual waste or green waste are waste accumulated in households/shops/businesses/schools that are not recyclable, these include metal, glass, waxed cardboard, Styrofoam cups and vessels, ceramic or non-recyclable plastics such as bio-plastics, melamine, thermoset plastics, polycarbonate. Plastics like thermoset plastics are composed of polymers that cross-link to form an irreversible chemical bond, implying that they remain intact forever and cannot remelt.<sup>5</sup> A greater part of the medical equipment's contain Polyvinyl Chloride, polyethylene, Polyphenylsulfone, polyetheretherketone and the like.
- 2) Infectious Waste- Includes waste that are potentially infectious or contaminated with blood, bodily fluids, tissues or any other body part that are generated while treated infected or ill-patients.
- 3) Hazardous Waste- Includes all kinds of waste that can have harmful and toxic effect on the health of living organisms when disposed in a delinquent manner.
- 4) Radioactive Waste- Waste that are potentially radioactive as a result of being used in radioactive procedures like chemotherapy (example- Liquid scintillation cocktails) or from research facilities.
- 5) Pharmaceutical Waste- The expired or unused medical drugs, personal care products, veterinary pharmaceuticals from health care facilities, pharmacy or homes.
- 6) Cytotoxic Waste – These are wastes contaminated with residues having genotoxic properties as a result being in contact with cytotoxic drugs(antineoplastics). They are potential carcinogens and can result in genetic mutation or allergic reactions. One of the most common cytotoxic waste is chemotherapy waste.

In past two years our dependency on disposable masks, Personal Protective Equipment's (PPE), such as nitrile gloves, goggles, face shields, PPE suits, sanitizers and syringes have sky

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<sup>3</sup> Prata, J.C., Silva, A.L., Walker, T.R., Duarte, A.C., and Rocha-Santos, T. 2020. COVID-19 pandemic repercussions on the use and management of plastics. *Environmental Science & Technology* 54 (13): 7760–7765

<sup>4</sup> Malyaj Varmani, Bio-medical waste management during COVID-19, Invest India Outlook, <https://www.investindia.gov.in/team-india-blogs/bio-medical-waste-management-during-covid-19>, 22 June 2020

<sup>5</sup> Alex Billingsley, Different types of medical waste, medical incineration, Incinerb, 2019

rocketed, we have seven billion people using one-time masks each day which has led to a massive trial of clinical waste in the ecosystem. The adverse effects of clinical debris can have a profound impact on the environment. The waste management system across nations is under deep trauma from the enormous pandemic generated bio-medical waste and being constantly under the government's radar. The virus might survive on the used plastic masks and PPE kits upto seven days, hence increasing the risk of infecting the waste collectors or public in general. The pandemic has endangered the lives of billions of humans around the world and now it poses risk to the survival of various species on land and water. The frequent cyclones followed by flash floods are indicative of climate crisis. Imagine the landfills being washed away in floods, directly entering into the residential areas or into the water bodies. The aftermath of such a catastrophic event would be futile to both the environment and its occupants. Even though we boast of five-year plans that would make us the next superpower, we fail to see our very real and possible near future.

## **II. INDIAN SCENARIO**

As per shared by Central Pollution Control Board (CPCB), India has generated over 18,000 tonnes of Covid-19 related bio-medical waste between June and September, 2020. On an average India generated about 183 tonnes of COVID-19 related bio-medical waste per day in September. Back in June, the figure stood at 101 tonnes per day. This quantity is addition to the regular bio-medical waste generation of about 609 MT per day (as of June 2020)<sup>6</sup>. In India the management of bio-medical waste is in accordance with the guidelines mentioned in Biomedical Waste Management Rules, 2016 (BMWM Rules).

The Government of India (notification, 1998) specifies that Hospital Waste Management is a part of hospital hygiene and maintenance activities. This involves management of range of activities, which are mainly engineering functions, such as collection, transportation, operation or treatment of processing systems, and disposal of wastes.<sup>7</sup> In terms of bio-medical waste management efficacy assessment conducted by the Central Pollution Control Board (CPCB) the union territory of Puducherry ranked first and scored a total of 21 points out of 24 points. Delhi, Himanchal Pradesh, West Bengal and Chandigarh fared well as opposed to Bihar, Punjab, Tamil Nadu, Maharashtra and Kerala. The assessment was based on the effective implementation of the provisions of the Biomedical Management Rules, 2016 and the initiative

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<sup>6</sup> COVID19 Waste Management status June 2020, Central Pollution Control Board Delhi, <https://cpcb.nic.in/covid-waste-management/>, 02 August 2021

<sup>7</sup> Govt. of India, Ministry of Environment and Forests Gazette notification No 460 dated July 27, New Delhi: 1998: 10-20

taken in each State or Union Territory.

### **III. A CASE OF PLASTIC PLAGUE**

In a country like India with a population of 1.3 billion there is no account of the number of individuals using the disposable masks, sanitizers or nitrile gloves on day-to-day basis and hence most of it ends up in landfills and marine land. Countries that had previously banned the usage of single use plastic find themselves in a fix over the past two years as we have become heavily dependent on the single-use plastic in the form of protective equipment's signifying a multifaceted environmental issue. It is no hidden secret that the medical field had undergone a revolution over the years with plastic being used as a raw material. The rationale being that plastic is cheap, easily sterilizable, long-lasting and everything else that makes it desirable over fabrics or metals.

Single-Use-Plastics are everywhere today, it is clogging up sewers, canals, ponds, rivers and other freshwater sources. These streams contaminated with viral residue serve as a medium for spreading the infection. The recommended masks like the N95 masks have triple layer wherein the outer- layer encompass non-woven fabrics that are liquid resistant, the second layer is prepared using a conventional fabrication method and contain a melt blown filter for bacterial filtration, finally the innermost layer is composed of fibres with softer texture to meet the criteria of comfort for the users. Due to their sophistication and high petrochemical content, they do not readily decompose. Bisphenol A, phthalates and PS oligomer are few toxic chemicals released when plastic breaks down which ends up further exacerbating acidification of the waterbody.

#### **(A) Impact On Terrestrial Organisms**

Curiosity is a trait exhibited by not only humans but also animals and birds, therefore certain fragrances and colours can trick them into believing that pharmaceuticals are safe and edible which might ultimately injure or even kill them. People using the disposable masks must detach the straps prior to disposal to safeguard the wildlife from being strangled or wounded. Animals unlike human beings cannot differentiate between their food and plastic waste, and can potentially be choked to death. Ironically, birds like sparrow use discarded masks to build nests. The presence of plastic waste in the nest's structure could also alter thermal and drainage properties, influencing reproductive success<sup>8</sup>. However, the negative effects far outweigh the positive ones. The micro-plastics have become so ubiquitous that they were even discovered

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<sup>8</sup> D.L. Thompson, "The prevalence and source of plastic incorporated into nests of five seabird species on a small offshore island", *ScienceDirect*, Volume 154, May 2020

in the placenta of an unborn child.<sup>9</sup> The bio-medical waste like syringes, gloves, masks etc., can have a longer sustenance of the virus than any other. The incinerators can increase the risk of air pollution and result in ozone layer depletion, further aggravating climate change. Fossil fuel combustion is a major contributor to air pollution-related deaths, which kill more than four million people around the world every year.<sup>10</sup> One 2016 study found that young patients exposed to a common PVC additive called DEHP (a type of phthalate) during intensive care showed signs of neurocognitive decline later in life.<sup>11</sup> Children were diagnosed with attention deficit disorder as a result of long-term exposure to DEHP from Intravenous tubes and catheters used in Intensive care units. These chemicals are known to cause hormonal imbalances. Hence, it can be concluded that these can put children at the risk of reduced cognitive development due to their delicate nature. During the peak of Covid -19 pandemic we saw a surge in the number of hospitalizations that required intensive care and along with it the unfettered use of single-use plastics leaving a mountain of waste behind. In an unusual case a 6-year-old girl from UK choked on face mask baked into McDonald's chicken nuggets.<sup>12</sup>

### **(B) Impact On Marine Ecosystem**

The plastic that ends up in the ocean when left untreated poses a greater risk to the aquatic animals and create a surge in deterioration of marine ecosystem which is already burdened with a glut of plastic waste. Researchers along the French Mediterranean coast documented with alarm that there are 'more masks than jellyfish' washing up on shorelines and littering the seabed.<sup>13</sup> The pharmaceutical waste or cytotoxic waste if absorbed by the marine plants and later are consumed by animals, it might intoxicate or kill them. People who follow a diet rich in seafood may develop neurocognitive disorders or cancer later in life as a consequence of consuming the contaminated marine creatures. Fish such as anchovies, Savoca has found, eat plastic because it smells like food once it's covered with algae. Algae are consumed by krill, a small crustacean that is the primary food source for many sea birds. As algae breaks down naturally in the ocean, they emit a stinky sulphur odour known as dimethyl sulphide (DMS).

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<sup>9</sup> DP Carrington, Microplastics revealed in the placentas of unborn babies, The Guardian, <https://www.theguardian.com/environment/2020/dec/22/microplastics-revealed-in-placentasunborn-babies> , Tuesday 22 Dec 2020, 05:55 EST

<sup>10</sup> Hope Ngo, "How do you fix healthcare's medical waste problem?", BBC- Future Planet, <https://www.bbc.com/future/article/20200813-the-hidden-harm-of-medical-plastic-waste-and-pollution> , 14 August 2020

<sup>11</sup> Amy Ellis Nutt, "Banned chemical still used in hospitals IVs is linked to attention deficit disorder", The Washington Post, 6 April 2016

<sup>12</sup> Connor Perrett, "A 6-year-old girl in the UK choked on her McDonald's chicken nuggets because they contained bits of a face mask, her mom says", The Business Insider, 6 August 2020, 17:08 IST

<sup>13</sup> Dr. Girija K Bharat, A Sustainable Development Agenda: Plastic and Biomedical Waste Post COVID-19, <https://www.teriin.org/article/sustainable-development-agenda-plastic-and-biomedical-waste-post-covid-19> , 24 Feb 2021

Sea birds in the hunt for krill have learned that the sulphur odour will lead them to their feeding grounds<sup>14</sup>.

The concern is not regarding the large mass of plastics accumulated during COVID-19 rather it is the decomposing plastic birthing micro plastics. These microplastics are smaller than 5 mm in size and if ingested, microplastics can block the gastrointestinal tracts of organisms such as the zooplankton, or trick them into thinking they don't need to eat leading to starvation.<sup>15</sup> Microplastics when ingested stays in the system for about 14 days as compared to normal digestion period of two days. Most microplastics are deemed to have some carcinogenic property even though there is no solid proof as of now. This break down is triggered when exposed to UV rays from the sun, tides or roughness of the oceans. Polypropylene a common ingredient used to manufacture plastic takes approximately 450 years to breakdown. Scientists have found plastic fragments in literally hundreds of species, including 86% of all sea turtle species, 44% of all seabird species, and 43% of all marine mammal species.<sup>16</sup> Along with toxic chemicals the virus laden masks, latex gloves and PPE kits can expose these organisms to hazardous toxins which can pave way for a new pandemic. The Zooplankton for example is a part of the food chain and a source of food for smaller fishes, it is virally circulated in our ecosystem as we consume these fishes.

#### **IV. BIO-MEDICAL WASTE MANAGEMENT(AMENDMENT) RULES,2018**

Medicine evolved all the way from the traditional ayurvedic treatments to today's sophisticated modern medicine. Changing lifestyle habits, increasing population, have paved way for the need of more hospitals and technological advancement in medical arena. The Bio-medical waste management rules refers all the infectious and hazardous medical waste as bio-medical waste and not as hospital waste or healthcare waste as it would reduce the scope of the act to the waste accumulated just by hospitals leaving out veterinary hospitals, medical waste generated at homes or businesses, research laboratories and pharmacies. Masks are mandatorily required to reduce the transmission of the infection through respiratory droplets but the corresponding increase in polymeric waste across India is a challenge that the Bio-medical management rules seeks to address.

The Bio-medical waste management(amendment) rules,2018 was the successor to Bio-medical Waste Management Rules,2016 and was amended to adapt with the ongoing covid-19

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<sup>14</sup> Natasha Daly, "For Animals, Plastic is Turning the Ocean into a Minefield", National Geographic, <https://www.nationalgeographic.com/magazine/article/plastic-planet-animals-wildlife-impact-waste-pollution>, June 2018

<sup>15</sup> Faye Haslam, The big problems of microplastics, University of Nottingham, <http://www.nottingham.ac.uk/>

<sup>16</sup> Wildlife Over Waste, Environment America, <https://environmentamerica.org/feature/ame/wildlife-over-waste>

pandemic induced crisis and the resultant accumulation of bio-medical waste. These rules shall apply to all persons who generate, collect, receive, store, transport, treat, dispose, or handle bio medical waste in any form including hospitals, nursing homes, clinics, dispensaries, veterinary institutions, animal houses, pathological laboratories, blood banks, ayush hospitals, clinical establishments, research or educational institutions, health camps, medical or surgical camps, vaccination camps, blood donation camps, first aid rooms of schools, forensic laboratories and research labs.<sup>17</sup>

The amendment has compressed the categories of bio-medical waste into four instead of ten for the ease of segregation. As per the amended rules the medical institutions are to present yearly report on the website within two years of the publication of these rules. The act requires all health care facilities that contribute to the generation of bio-medical waste such as hospitals, medical camps, pharmacies, veterinary hospitals to opt-out chlorinated plastic equipment's such gloves and bags. The act does not apply to the collection of radioactive waste, hazardous chemicals, solid wastes, the lead batteries, e-waste and hazardous microorganisms. The act mandates that the occupier should not own an on-site health care waste treatment and disposal facility in a case where there is a health care waste treatment center is available within seventy-five-kilometer distance. The occupier of the bio-medical waste should not dispose the waste along with municipal solid waste. The amended rules also require the waste management industries to upgrade to modern incinerators that emit lesser amounts of pollutants into the environment and to maintain a record of all operation of autoclaving, hydro or incineration for a time period of five years.

After ensuring initial treatment of such waste at hospitals by methods of incineration or autoclaving followed by shredding, the waste shall be sent to authorized recyclers of the State Pollution Control Board. Vehicles used in transportation of bio-medical waste to the treatment facilities are to be labelled as provided under part A of the Schedule IV including requisite details as mentioned in part B of the Schedule IV and are required to comply with the rules if any stipulated by the Motor Vehicles Act, 1988 and State Pollution Control Board for transportation of hazardous waste. Microbiology waste and all other clinical laboratory waste shall be pre-treated by sterilization to Log 6 or disinfection to Log 4, as per the World Health Organization guidelines before packing and sending to the common bio-medical waste treatment facility.<sup>18</sup>

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<sup>17</sup> Government of India, Ministry of Environment, Forest and Climate Change, Notification, Gazette of India, Extraordinary, Part II, Section 3, Sub-section(i), 28 March 2016

<sup>18</sup> Government of India, Ministry of Environment, Forest and Climate Change, Notification, Gazette of India,



The Extended Producer Responsibility (EPR) guidelines combined with Bio-medical management rules can be a promising way to address the plastic pollution. In the field of waste management, extended producer responsibility (EPR) is a strategy to add all of the environmental costs associated with a product throughout the product life cycle to the market price of that product.<sup>19</sup> Through EPR the waste generator industries are held responsible to collect back the residue plastic waste from their products post-consumer use. The materials so collected by the waste disposal facility which is approved by a Producer Responsibility Organization Agency after treatment can be used as raw material for road construction, to make concrete structures, pyrolysis and further reduce the dependency on fossil fuels. EPR should be included as a part of sustainable business practice and corporate social responsibility to meet our environmental goals.

## **V. AN EFFICIENT BIO-MEDICAL WASTE MANAGEMENT SYSTEM – THE NEED OF THE HOUR**

According to WHO's health guidelines, solid tissues and used face masks must be thrown only into lidded litter bins, while any medical gear used by the affected patients and hospital staff must be sterilized and burnt at high temperatures in dedicated incinerators.<sup>20</sup> The cities with decentralized waste management system are at ease as compared to cities with centralized waste management system. Appropriate systems at the local level along with a two- or four-year action plan to back up is a necessity. The prime responsibility of governments across the world is to establish a flexible waste management system, focus on capacity building, formulate new response strategies and enhance existing facilities. Only a handful number of cities today have a facility that processes all the bio-medical waste from the health care facilities.

One of the major concerns that need to be addressed is the lack of proper segregation, stringent protocols and awareness among common people. Disposable masks are essentially made of polypropylene and high density of polyethylene, and might contain other polymeric materials such as polyesters, polyurethane, polystyrene, and polyacrylonitrile<sup>21</sup>. It is important to ensure that people do not burn used masks or similar equipment's, they are required to separate the hazardous waste from that of non- hazardous, this to a certain extent will reduce the burden

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Extraordinary, Part II, Section 3, Sub-section(i), 28 March 2016

<sup>19</sup> OECD (2021), Extended Producer Responsibility: A Guidance Manual for Governments. Paris: OECD Publications Service.

<sup>20</sup> Interim guidance, Water, sanitation, hygiene, and waste management for SARS-CoV-2, the virus that causes COVID-19, World Health Organisation, <https://www.who.int/publications/i/item/WHO-2019-nCoV-IPC-WASH-2020.4>, 29 July 2020

<sup>21</sup> Ana L. Patricio Silva, "Risks of Covid-19 face masks to wildlife: Present and future research needs", Elsevier, Volume 792, 20 October 2021.

and volume of waste that require specialized treatment. The risk of contamination and exposure over large areas of inhabited land is sky high when the waste is openly burned, because of the toxic nature of the substance, this might ultimately trigger the onset of new diseases. If not properly segregated or disposed it can lead to contamination of the groundwater in addition air pollution. The reusable masks have a lower carbon footprint and is a better alternative to the one-time use masks. It is encouraged to carry an extra re-usable mask as one might buy a disposable mask if something goes wrong. If at all one has to buy a disposable mask, the buyer must responsibly take back the mask home and dispose it in a bin with a lid or a Covid-19 designated public bin. Additionally, the certifying agency is required to ensure that the masks manufactured are assessed according to their environmental performance.

Lately, masks made from Abaca fibre – a relative of the banana tree is gaining popularity as governments and manufacturers all around the world scamper to produce more reusable and safe medical garments for healthcare professionals. It is as durable as polyester but will decompose within two months, A preliminary study by the Philippine Department of Science and Technology showed abaca paper to be more water resistant than a commercial N-95 mask, and to have pore sizes within the U.S. Centres for Disease Control and Prevention's recommended range to filter hazardous particles.<sup>22</sup> The drawback here is that the cost of production of abaca fibre is way higher than that of plastic and Philippine agriculture lack support from government to ramp up the scale of production.

Hospitals need to equip themselves with a medical waste disinfectant supported by microwave technology. It is proven that this method is successful in disinfecting the bio-medical waste thereby turning it into normal waste which then becomes easily disposable. Hospitals can also adapt to the common but effective method of steam sterilization or chemical disinfection. The point of origin of a sizable amount of bio-medical waste is the hospital hence the proper segregation can minimize catastrophic effect on the ecosystem. The waste ought to be packed properly to keep the informal waste workers, birds and animals away without exposing them to the infectious content while disposing off the waste from hospital to landfill. Hence, it should be mandatorily labelled by citing the contents and disposed in the designated double-layered yellow bags meant for Covid-19 waste. Tossing bio-medical waste into incinerators can cause air pollution from toxins like furans and dioxins being released into the atmosphere while burning. Thus, hospitals must switch to modern incinerations with advanced designs that can

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<sup>22</sup> Andreo Calonzo, "Masks Made from Banana- Tree Species Cut Covid's Plastic Waste", BloombergQuint, <https://www.bloombergquint.com/business/masks-made-from-banana-tree-species-cut-covid-s-plastic-waste> ,29 July 2020, 2:30 AM

burn at an extremely high temperature varying between 850°C to 1100°C, fitted with air pollution control systems. Most modern incineration plants incorporate heat recovery as well as power generation facilities to recover the heat energy in the waste.<sup>23</sup>

**“The Polluter Pays Principle”:** The principle was first laid down in a report in 1972 by the Organisation of Economic Cooperation and Development. The principle holds the polluter liable for every action or omission of theirs that resulted in deterioration of environment. It aims at protecting the environment from further degradation. The polluter is under the constitutional mandate to provide appropriate compensation to the victims of the polluters negligent agent that exposed them to a serious health hazard and are under the obligation to restore the environment back to normalcy. Therefore, it is equally important that the citizens ought to be aware of their rights and duties for being a responsible citizen and ensure that their action do not harm our ecosystem in any manner. This principle is however not free from ambiguity as it poses a question as to how the actual polluter is determined. Often the effects of man-made disasters are realised years later after the actual event has occurred as in the case of Bhopal gas tragedy or the Chernobyl incident, in such cases the compensation paid soon after the incident falls short of the actual damage caused. In M.C. Mehta v. Kamal Nath and Ors (1997) <sup>24</sup>the apex court held indulging in activities that cause pollution is a tortious act punishable under the civil law. It is against the ideals of a responsible citizen; thus, such offenders are required to pay damages equivalent enough to restore the ecosystem. The liability of the tortious act does not fall on the state as it would directly fall upon the taxpayers who are nowhere responsible for the restoration or remedial activities. Likewise in the case of Indian Council for Enviro-Legal Action v. Union of India (1996) The Court held that once the activity carried on is hazardous or inherently dangerous, the person carrying on such activity is liable to make good the loss caused to any other person by his activity irrespective of the fact whether he took reasonable care while carrying on his activity. The rule is premised upon the very nature of the activity carried on.<sup>25</sup> The concept of extended producer responsibility is based on the polluter pays principle.

In India a specific task force can be established to tackle miscreants with the help of CCTV or volunteers from public. It is advisable to start with an area under the menace of bio-medical waste from medical facilities. As we already find people who do not wear masks properly

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<sup>23</sup>“Problems and Solutions”, Environmental Protection Department, The Government of the Hong Kong Special Administrative Region, [https://www.epd.gov.hk/epd/english/environmentinhk/waste/prob\\_solutions/WFde\\_v\\_IWMFtech.html](https://www.epd.gov.hk/epd/english/environmentinhk/waste/prob_solutions/WFde_v_IWMFtech.html)

<sup>24</sup> AIR 1997 1 SCC 388

<sup>25</sup> AIR 1996(3) SCC 212

similarly fine can be charged on people who litter such infectious waste on public land. The government can involve private agencies to achieve this goal. With increasing awareness of the detrimental effects of microplastics on the ecosystem, committees and social groups are now advocating for removal and ban of microplastics from various products. One such campaign is “Beat the Microbead”, which focuses on removing plastics from personal care products.<sup>26</sup> Controlling the amount of hazardous waste generated can prevent them washing up on sea shores, decimating the homes of mammals and aquatic species alike and the destruction of our ecosystem in general.

Humans ought to remember that they are not the sole owners of the planet earth, we share it along with millions of other species and just like we have the right to life every other living organism has it too the only difference being that they are not capable of approaching the court in case of violation. Humans today are devoid of humanness and moral instincts. Saving lives of people remains our top priority, however it must not be at the cost our planet’s ecosystem. One of the main goals in the post-pandemic world would be to build a greener, secure and sustainable ecosystem.

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<sup>26</sup> International Campaign against Microbeads in Cosmetics, Beat the Microbead, 15 march 2015