

LET US STOP CHOKING THE EARTH- WHY IT HAS BECOME NECESSARY TO SAY 'NO' TO PLASTIC

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ABSTRACT: Until a few years ago, we could conduct most of our activities using cloth, jute, metal and ceramic items. Since 1907. plastic in a myriad form invaded the Earth. It soon became all pervasive, and now most of the things we use in our everyday lives, are made of plastic- either entirely or in its component parts. We did not consider for a moment about how fast its use would spread to every nook and corner of our planet, and not in the least about the effect it would have of our ecosystem- in which we and other living organisms survive. It is only lately that that we have woken up to the grave dangers this plastic monster poses to our planet and our survival. If our future generations are to live on a somewhat healthy planet, and are to have a somewhat normal life, we have to become increasingly aware of the way life, in all its forms, is getting terribly adversely affected by the plastic menace; and why it is so necessary to stop its use NOW and seek alternatives. This paper discusses the extent of the problem, its harmful effects and attempts to offer possible solutions at our level.

Keywords: Plastic, Effects, Reason, Extent, Alternatives

1.INTRODUCTION

'Humanity's long toxic love affair with disposable plastic is choking the world's rivers, and threatening wildlife, contaminating the food chain and helping to drive the climate crisis.' (Stockholm +50.February 2022)

What began as flirtation with plastic in 1907, when Leo Baekeland patented the world's first synthetic plastic and christened his invention Bakelite, soon captured the fancy of the entire world, and rapidly progressed into an abiding love affair with the material. Little did the world realize then that this was going to choke the very life out of this planet and heavily burden mankind with toxicity that wouldn't be gone in a million years.

Be it on land, in landfills, on mountains, in water bodies – ponds. Lakes, rivers, seas and oceans- plastic trash has become so ubiquitous in its presence, that it has ceased to surprise



or worry us, not only in developing countries, where regulatory laws are either non-existent, or poorly implemented, but also in developed countries where some laws are in place.

Plastic was, until quite recently, a unique material, but the conveniences its' use offered, and the low cost and ease with which it could be manufactured, had millions of factories churning out plastic goods in a variety of forms. Be it for storage of food and drink, medicines, to its rising use in electronic goods and automobiles, it is omnipresent. It can be seen in life saving medical equipment, including incubators; space travel, aero planes and jets, its literally everywhere. It is necessary to understand that something we are so dependent on may be beneficial in a lot of ways-but the biggest drawback of plastic is its lack of degradability and a lot of times lack of recyclability, building up toxic waste like no other material and thus choking the earth.

2. Alarming facts

- Global Plastic production increased from 1.5 m metric tons annually in 1950 to around 275 m metric tons in 2010 and nearly 400 m metric tons by 2021; production is expected to grow exponentially in the near future;
- Single -use plastics account for around 40% of the plastics produced annually;
- At least 500 billion plastic bags are used annually around the globe;
- Only 9% of plastic is been recycled, and 12% incinerated, the rest have been thrown away in the environment, deposited into landfills, rivers and oceans;
- Incinerated plastic is a major cause of air pollution-releasing harmful carcinogens, such as dioxins;
- 4.8 to 12.7 m metric tons of plastics are discarded into oceans every year, where they break down, releasing greenhouse gases;
- Around 44% of plastics in rivers and oceans comprised of plastic bags, bottles, straws and other items related to take-out meals;
- Plastics that contain additives to make them last longer, may take more than 400 years to break down;
- 2015 greenhouse emissions from plastic were a gigantic 1.7 Gigatons of carbon dioxide equivalent and this was projected to rise further to 6.5 GtCO2e, by2050,



which would be 15% of the global carbon budget needed to keep global temperature rise below 1.5°C;

- Landfills, where thrown away plastic litter are sent, account for over 15% of methane emissions;
- High income countries generate more plastic waste per capita;
- Low and middle-income countries were the major contributors of plastic waste emissions in rivers and oceans;
- About 60% of material made into synthetic clothing was plastic, including acrylic, nylon and polyester clothing.

(The facts stated above have been collected from various sources, like UNEP, Our World in Data; NatGeo; Britannica, OECD, and CIEL)

The data shared is reflective of only the tip of the iceberg. What the world is staring at is a dark, bleak future in the absence of strong measures taken quickly and in unison by all governments in every nation in the world.

3. How plastic inflicts harm

Natural 'plastics'-polymers, like rubber, silk, etc., are biodegradable, therefore, they are not a cause of worry. Synthetic plastics are non-biodegradable. Hence, they will persist in the environment for millions of years. Not only will they stay on in the environment forever, they have toxic impacts throughout their lifecycle. Add to this the fact that more than half of the plastics are improperly disposed of. Unlike materials like iron, aluminum, glass, etc., plastics have a low recovery rate, i.e., their chances of being usefully recycled are very less. Disposed plastic breaks down over time into smaller and smaller fragments called 'microplastics'. Now evidences have been gathered that microplastics are breaking down further into much smaller pieces called 'microfibers. These have become almost omnipresent, being found in drinking water to being present in the air we breathe. One can only begin to fathom the extent of the harm it has started inflicting on life in *all* its forms.

Plastic is being consumed by terrestrial animals, including elephants, zebras, hyenas, tigers, camels, cattle and others. This has and continues to cause early and extremely painful deaths of these creatures. Their stomachs get packed with the plastic they have consumed



As a result they do not feel hungry and starve to death. Moreover, plastic that they have ingested blocks their digestive tracts and stick to their intestines, literally choking them from inside, apart from the grave harm caused by the leached carcinogens from the additives to plastic.Land birds have been found with plastic in their stomachs, leading to the same painful fate.

Most of the plastics that are disposed off find their way to the oceans through rivers. Since the use of plastic has increased exponentially, this deposition has been rapidly rising too. The flow of waste plastic into aquatic ecosystems is estimated to increase from 11m tons in 2017 to about 29m tons by 2040. (Source UNEP.2021).It alone accounts for over 85% of all marine waste and is by far the most harmful. It has been found that more than 1000 rivers all over the world add over 80% of plastic emissions into oceans. Here, the combined effects of sunlight, wind, and wave actions break them down to microplastics and to microfibers, which are unconsciously ingested by all forms of marine life-right from tiny zooplankton and shellfish to large cetaceans, turtle, large variety of fish, shrimp and larger creature like sharks and whales. All species of Seabirds, which feed on them also become victims. By 2018, microplastics had been found in the organs of more than 114 aquatic animals. This life, the UNEP says,"...Faces the grave risk of toxification, behavioral disorders, starvation and suffocation. Corals, Mangroves and seagrass beds are also smothered by plastic waste preventing them from using oxygen and light."

Such is the expanse of this toxic waste, that larval fish have been found to be ingesting nanofibers as soon as they are born. Another disturbing fact is that apart from liver and cell damages to these organisms, evidences have shown disruptions in their reproductive systems, causing them to produce fewer eggs. Plastic is now been increasingly seen as a big contributor to the extinction of many species.

Man, who was responsible for bringing this toxic material into existence and using it mindlessly, is a victim too. Once microplastic has reached the environment, it rapidly gets assimilated in the food chain. Toxins present in the micro and nanofibers gets leached into the soil producing crops, terrestrial aquatic food chains and even air and water. These are ingested by humankind through food-crops, vegetables and fruits, seafood, fish, even salt-through the air we breathe and even through our skin. These toxins remain in the



environment for humans to ingest directly and indirectly. This has been found to cause aa alarmingly wide variety of health problems from inflammation, necrosis, genotoxicity and other. They are the reasons behind multiple diseases like, cancers, cardiovascular problems, diabetes, arthritis, auto-immune disorders, strokes, neurological diseases and others. They have also been reasons to cause hormonal changes, reproductive problems and developmental disorders. We are all witness to the rise in the number of people suffering from these issues.New evidences have come up showing horrific case of microplastics being found in the breastmilk of lactating mothers. Dioxins and furans have been seen getting transferred from mothers to babies through the placenta.Should we pause to ask ourselves some questions?

Plastics, in general have a huge impact on the human rights of people and communities, including right to health.

4. Lifecycle of harm

Synthetic plastic cause harm to the ecosystem and human beings at all stages of its lifecycle. The first stage of the lifecycle of plastic is naturally extraction and transport of fossil fuel, because 99% of plastic is manufactured from them. This is believed to be the biggest driver of the growth in oil demand. The process of extraction produces emissions including Benzene, VOC, and more than 170 toxic chemicals in fracking fluid. This cause exposure through inhalation and ingestion via air and water. They have documented impacts on humans, in the form of cancers, neurological. reproductive and developmental disorders, liver and kidney problems, respiratory and gastrointestinal impacts. Not only this, there are hidden costs as well. For instance, the cutting down of forests for extraction of oil and laying of pipelines releases billions of metric tons of carbon dioxide into the atmosphere, while restricting the amount of carbon dioxide removed. It is also, a known fact that fracking is harmful for the environment.It leads to pollution of water, soil, and air.Itcreates underground cavities that often collapse, making underground rock structures unstable, leading to earthquakes.

The second stage is the refining and manufacturing stage. The fossil fuels collected are now transformed into plastic resins and uses additives which release toxic Benzene, PAHs and Styrene. Human and other living creatures are exposed to them through inhalation,



ingestion and skin contact via air, water and soil. Health impacts can range from cancers, neurological and reproductive toxicities, genetic disorders, etc.

The third stage deals with packaging and use of consumer products. At the user stage, emissions may range from carcinogens to heavy metals, microplastics and many more, all capable of severe harm. They may be inhaled or ingested, or come into skin contact. Once inside the human body all these chemicals cause extreme damages to the body. They have been known to cause gastrointestinal disorders, renal problems, cardiovascular problems, reproductive and respiratory disorders, diabetes, endocrine disruptions and developmental issues.

Finally, when they are discarded after use, they end up in the environment in different forms and cause untold damages to the ecosystem and to all living organisms on earth. Waste management of plastic affect those who are handling it.Through skin contact, inhalation and ingestion, waste plastic harms all. Techniques like incineration, pyrolysis, gasification, and others release harmful metals like mercury, lead, dioxins, furans, acid gases, etc. in the air, water and soil. Thus these substances find their way to all workers and communities nearby, through water, toxic crops, fruits and vegetables grown in these soils, Fly ash and other airborne materials travel long distances from where they have been originally released. They may get deposited on water surfaces, soils, plants,etc, which when consumed by humans enter their system. All these toxins take a heavy toll and may result in damages to the endocrine, reproductive, nervous and neurological systems and may also cause developmental problems and cancers.

Not only is humankind adversely affected by these toxins. When they have been released in the environment, everything that comes in contact with them suffers. Since, its everywhereair, water, soil, in plants and crops, in grass and fruits, it naturallyfollows that all forms of life on land water and air have to bear the painful brunt of man's mistake and greed. Disturbing images of the horrible suffering deaths of creatures on land, water and air, caused by ingestion of plastic often surface. Are we troubled?... Only momentarily. We then move on as if all's right with the world. Sadly, it's not. On the contrary.



5 .Single- use Plastics

Plastics come in many forms-PET, HDPE, PVC, LDPE, PP, PS and others. Of all these forms, single-use plastics are the worst offenders. Such plastics, as the name suggests, are used only once, then they are discarded into the environment where they will remain for years to come.Thus, most of the plastic being produced and discarded comprise single-use plastics.Around 50% of the plastics we use are single-use plastics. They range from cigarette butts, to straws, plastic bags used by most grocery stores, coffee cups, plastic cutlery, cotton buds, plastic containers, disposable plastic water bottles. etc. They are the ones that end up in landfills, waterbodies and oceans choking animals that eat them.

6. Solutions

Though complex, the solutions to this monstrous problem do exist and should be adopted and implemented by all nations of the world immediately.

The most important step is making and implementing legislations and regulations. Stricter rules need to be made and even more strictly and continuously monitored. A system of reward and punishment must be put in place to discourage the use of plastic and use healthy alternatives. Waste management, including plastic waste management systems have to be created on a large scale and existing ones improved. Recycling of plastic products must be taken up seriously by the authorities and implemented with the help of the public. Green accounting should become the way a nations economic performance is measured. This will force countries to immediately adopt measures to stop or at least drastically reduce the use of plastic and seek better alternatives.

Research should be pushed urgently to evaluate the numerous ways plastic use exposure is impacting and threatening the environment and its inhabitants, including humans.

All plastic products should come with precautionary warnings, about their effect on health.

Legal frameworks need to be drawn up to access information about plastic products and their impacts on health and environment at all stages of their lifecycle.

Awareness campaigns must be carried out on a large scale to elicit public participation. People like we can do a lot at the practical level to bring about a positive change. The immediate step we can take is to stop using single-use plastic items. One of the biggest sources of plastic pollution are the plastic bags we use for our regular purchase of grocery,



vegetables, fruits, etc. These are the most common single-use plastic items found dumped everywhere, and the biggest villains to life, It is these that cause unspeakable suffering to animals,terrestrial. aquatic, even birds. They also leach their chemicals in the soil, which poisons the crops and fruits grown there and find their way to the water table, toxifying it. It finally ends up harming humans. It's high time, we quit accepting and using such plastic bags for our own good. With We should carry our own cloth or jute bags to grocery stores.

We can also contribute to lessening the growing burden of toxic plastic waste by refusing to use plastic straws and stirrers as also plastic cutlery items for partaking food and drinks with. immediate effect. We can use metal or wooden cutlery instead. We should stop using plastic or even paper cups for having coffee or tea. Instead, we may use metal or ceramic cups or even our very own 'kulhad'. In place of plastic straws, we must use paper straws or those made of metal or glass. It is an excellent idea to carry one's own reusable water bottle.A novel product that has come to the market and is feasible, is edible spoons and other cutlery items. A healthy option to plastic plates is again, our Indian plates made of leaves.

Overly packaged items such as pre-cut fruits, etc. should be avoided. We may also repurpose old used batteries and containers. We can reuse plastic containers for a variety of purpose, right form storing things, to using them as planters to grow plants. People could also seek out reusable menstruation products, bamboo toothbrushes and other such alternatives to plastic wherever possible.

Since, as discussed earlier, synthetic clothes have a big percentage content of plastic in them, therefore it is necessary to avoid such materials for clothing- which do more harm than good.Washing of these clothes often leads to shedding of microfibres. It has been estimated that every year about half a million plastic microfibres find their way to the oceans from such laundry. Therefore, avoid synthetic clothing as far as possible.

Cigarette butts are also a source of such pollution. Smoking is injurious to health, we all know. The butts have filters containing cellulose acetate, a type of plastic. These are thrown away anywhere and everywhere, ending up in landfills and water bodies, there to stay for millions of years causing damage to the life forms of various types as well as the environment at large. Thus, it is best to give up smoking.



Finally, we have to take action to clean up the plastic litter wherever possible, particularly near seashores and on land and spread awareness amongst others to stop this menace from spreading. Schools, colleges, neighborhood communities NGOs and others have to join hands in this effort. The sooner we do this, the better are the chances of preventing further deaths and diseases from escalating related to plastic.

7. CONCLUSION

There is an urgent need to address one of the biggest threats to our planet and all its lifeforms- the ever-growing burden of plastic toxicity. Though the world has been aware of the horrific effects plastic has on life for a long time now, it has chosen to ignore it for extremely selfish and self-centered goals of profit making by nations and corporates. The right to information regarding the harmful effects of plastic products and their extent had been grossly infringed upon. Misinformation campaigns have been unleashed on the world by the big players in this industry and this has hidden the true costs of this menace from becoming public.

But the untold harm that the material and its unregulated use has caused has set alarm bells ringing. The evils of the use of this material are being discussed and debated on in places where decisions are taken, although effortsare made to push it under the carpet, to not make things uncomfortable for huge corporations and powerful governments. But we have to catch the bull by its horns. We cannot afford to waste a moment more in procrastination. The world needs to tackle the problem by making informed decisions and drawing up a list of dos and don'ts for the nations of the world and implement them with immediate effect. The rules can be categorized into short, medium and long term aims, to achieve the desired objective in a phased manner. This will give time to countries and societies to make adjustments, while at the same time reduce this heavy toxic burden.

As the world has woken up to the grave issue of plastic pollution, concerns are being voiced on various platforms, like United Nations Environment Assembly (UNEA), which has suggested some policy responses to reduce plastic in the environment;Basel Convention of 2019 adopted Plastic Amendments, that came into force from January 2021; Stockholm Convention saw the matter of how to regulate some toxic additives in plastic discussed; even the WTO is making efforts to see how international trade rules can be used to help



deal with the problem;UNCTAD is promoting research and policy dialogue on the topic; The International Organization for Standardization (ISO) is also trying to address the issue;Human Rights Council has allowed to raise the issue of plastic vs human rights; the World Health Assembly and the ILO are discussing the effect of plastic pollution on health and labour safety. The burning topic is now constantly being discussed amongst governments, states, businesses, scientists, social workers and individuals. We as individuals can also do a lot to deal with this problem. Let us take a silent pledge to reduce our toxic footprints on this earth and leave it a more sustainable place. We may then see our future generations living a healthy and fulfilling life on this planet.

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