Petroleum Based Plastic: An Emerging Issue for Environmental Sustainability

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Abstract- *Oil-based conventional plastics are contributing a big share in today's developing urban lifestyle. Plastic have become an indispensable part of life in urban areas because of its ease, cheapness and the use of convenience but the negative effects of plastic are increasing today. Petroleum based plastic is not biodegradable due to critical structure. Also it is difficult to reuse or recycle. Municipal solid waste which is about 12% plastic waste. In an open field plastic waste version, poisonous gas is released in the atmosphere of dioxin, ferons and mercury. However, poisonous substances are completely in danger of vegetation, human and animal health and the environment. Recently, renewable natural resources have made significant progress in the development of bio-degradable plastic.*

Keywords- Bio-degradable plastic, Impact, Solid waste, Incineration

I. INTRODUCTION

Plastics are used almost everywhere, such as regular home packaging materials, bottles, cell phones, printers etc. It is used by pharmaceuticals from automobile businesses. They are useful as synthetic polymers, because their structures can be converted into a number of energies and shapes to get chemically high molecular weight, low reaction, and longer durable substances. Plastic is important because it is durable and efficient for everyone. Plastic has become a major environmental problem. In fact, "Americans pass more than 25 billion plastic bottles every year. Unfortunately, this plastic bottle with other forms of plastic takes" 25% "of the landfill and the total volume of pollution. The plastic in the landfills site is very slow, the original product is our Landfill size can last for thousands or thousands of years [1].

Nowadays, people are more aware of the harmful effects of petrochemicals obtained in plastic in the environment. Researchers have done many research by explaining plastic waste management in an environmentally-friendly alternative to the plastic. This eco-friendly alternative is bio-plastic, which is disposed in the environment and can easily be softened by the enzymatic functions of microorganisms. Biodegradable plastic degradation produces carbon dioxide, methane, water, biomass, human materials and various other natural substances that can be easily removed.

Considering the reduced reserves of the biotech industry, bio-plastic shows the major consequence in this field about 4%.

The world's oil production products are converted into plastic, such as shopping bags and car exterior panels. Due to increasing demand and cost of fossil fuels, there is a need to replace the fossil fuels by sustainable resources. Petroleum based plastic production generates greenhouse gases in the atmosphere, which reinforces global efforts to reduce CO_2 emissions [1].

Environmental dilemma, climate change with more distant influences generally, the revival of industrial biotechnology needs to reduce rapid and deep greenhouse gas (GHG) emissions, and bio-based plastic discovery is done more precisely. Plastics are based on bio-based innovation, but it is not necessary to report bio-degradability. The pattern of the product ranges from truly biodegradable plastic to plastic on a biological basis and the trend is likely to continue in the future.

Plastic production is main cause of generation of greenhouse gases. Atmospheric GHG concentration is 450 ppm. For sustainability in CO_2 in the Climate Change (IPCC) of 2050, the Intergovernmental Panel needs to reduce 80% of emissions compared to the 1990 level [1].

Perhaps the next generation is the greatest human challenge. Many countries have set targets to seriously reduce greenhouse gas emissions, and developing a biology-based economy is part of a strategy for many. The biology-based economy emerged for the first time as the concept of a policy within the TOC, which at the beginning of the century united renewable biological resources and bioprocesses to generate jobs and income from sustainable products through biotechnology on an industrial scale.

Substitutes made from organic materials are helpful to overcome the problems cause by petroleum plastic.

II. IMPACTS OF CONVENTIONAL PETROLEUM BASED PLASTIC

Impact on the Environment

In recent days the plastic is a major toxic pollutant. Due to toxic chemicals and, more importantly, to non-biodegradable substances, pollute the plastic planet and generate air pollution and water pollution. This connects the chains food is important as it affects humans and animals. The environment gets severely damage during disposal process of plastic waste.

Another important cause of the negative environmental impact of plastic is the emission of toxic chemicals during the production process. The entire range of cancer-causing, neurotoxic and hormone-disrupting chemicals are standard components and they find their way through the contamination of air, water and land through our aquatic ecosystem.

Most important advantage of plastic are its durability and effectiveness. During the installation, there is also a great concern for commercial exposure, such as plastic tubing or steam treatment with interruption of therapy, inhalation of dust, human health and the environment.

Destruction of plastic: One of the most desirable plastic properties, durability and resistance to decomposition, when it comes to plastic removal, is one of the biggest responsibilities. Natural structures require more to break the complex bond within the plastic, making that material a huge survival problem. Only about less than 10% of total plastic waste is being recycled. The remaining portion of plastic waste is sent to the landfill sites for its final disposal, where it is first segregated from the all solid waste and then it is sent to the recyclers for further usage.

Unfortunately, due to the low density of the plastic, it often "overlaps", throws out of the landfill and closes the garbage disposal. In 2005, the estimated contamination surface area increased to 11 million square miles. 89% of waste was the plastic and 80% of the source came from the original soil, such as construction waste.

Effects on Humans

Plastic affects our health and environment in the same way. Not only plastic waste in coastal areas, but plastic chemicals also affects and sometimes it poorly controls the recycling systems of landfills.

During hunting, many plastic animals eat plastic by mistake. For example, the fish can break the plastic pellets for plankton, birds can make mistakes for plastic pieces or other prey [7, 8].

Within the plastic material, it has a number of chemicals such as bispinol, fetish let and flame retardants that have been added to provide the special properties. There are also poisonous monomers associated with cancer and reproductive problems. What is known is the level of plastic-which is not obvious and for some reason the mechanisms affecting humans and animals due to plastic chemicals are not fully established. Most of the road is by injection, then chemicals can accumulate a bio-food chain, which means that top-level individuals can contact more chemical layers.

Plastics can potentially turn these chemicals into a clean environment and when transplanted plastic can be converted into organisms when used by wildlife. In some situations, however, plastic can act as a pit for polluters, making them less available to wildlife, especially when buried on seaweed, compared to large quantities of plates, micro-plastic chemicals compared to large slabs. Possibility to make animals in the wild and more accessible to the environment.

The use of plastic, especially after packaging and cloth, is thrown, but because it is sustainable, they remain in the surrounding. When the plastic reaches the ocean, the lower density means it stays on the surface. Some plastics are bio-degradable and can be degraded in to a controlled environment, such as landfills, but it is not clear if it is in other circumstances, especially in the oceans where the temperature freezes [10].

The dangerous impacts of additives present in the plastic are also introduced by mothers during pregnancy in new born infants without poisoning. It is also responsible for hormonal disorders and cancer in children [11].

III. GLOBAL SOLID WASTE COMPOSITION

- The impacts of global warming on the environment due to the continued production of conventional plastics have been an issue on the rise which has led to a demand for products that are environmentally friendly.
- The recent study indicates that industrial sectors and researchers have had augmented interests in production of plastics that are bio-based.

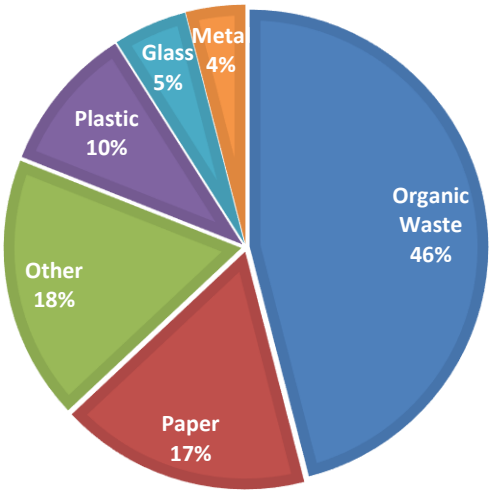

Figure 1 Global Solid Waste Composition

Indian Scenario

Especially in urban areas, plastic waste causes major environmental and health issues. In our country, plastic shopping or carrier bags are the main source of plastic waste. Because of India's abuse and overuse and dirt problems, plastic bags in all sizes and colours live in the city's environment. In addition to this pollution scenario, plastic bags contribute to waste dirt and sewerage risks, while they are hazardous to water supply when they find their way to reservoirs, and livestock can be killed if cattle eat them. The plastic has become predominant because of its cheapness and availability in wide range. When contaminated by chemicals, sunlight, and bacteria, the plastic insulates the strong but lightweight, immune and heat and lightning.

The type of exercise practiced in India's recycling is very different from the rest of the world, where it does not work in technology. Later, the frets are transported to the granulator to obtain granules with conventional mechanical and grinding techniques. The converter uses these granules to make whole plastic products. Most of these devices (granules and converters) are usually located in the slums and extension devices with one machine work. Storage of scrap takes place in the backyard and is washed in open drums. The techniques used in these industries are both old and domestic. PVC (polyvinyl chloride) is responsible for 45% of the recycled plastics in India, LDPE (low density polyethylene) 25%, HDPE (high density polyethylene) 20%, PP (polypropylene) 7.6% and other polymers. Concerning PS (polystyrene) for 2.4% [17].

When recycling, bicycles are usually placed under the plastic in products of lower quality, which are high and drink 4 layers, toxic additives [18]. During recycling, plastic discs are cleaned to remove dirt and foreign objects to keep it away. The wastewater used for this purpose has finally been drained into public rivers. In this environment, BOD, COD and TS [16] in terms of high pollution load.

The final phase of the plastic life cycle has been removed. In India there are three ways to remove plastic - by dumping them in the ground, burning them in the ovens or crushing them. The final phase of the plastic life cycle has been removed. In India there are three ways to remove plastic - by dumping them in the ground, burning them in the ovens or crushing them. Plastics waste significantly reduces the amount of garbage required for synthesis disposal [19].

IV. PREVENTIVE MEASURES

Recycling

Current solutions are the most flexible and easy way to recycle. There are different ways to participate through government programs or programs of environmental organizations. As a consumer, there is a simple way to put plastic waste in a suitable container for recycling. Separating plastic waste from other waste will prevent the recycling of plastic from filling the clay and the same plastic with other plastic.

Recycling techniques work together with plastic waste tones that cool the earth. So in addition to developing a smart plastic instead of conventional plastic, there is an emerging need to deal with the enormous amount of toxic waste outside and to damage people and the environment. Sorting with plastic, energy-efficient ways to get rid of plasticizers and it is very important to remove this challenge by increasing the overall size of the process. To speed up the reduction of traditional plastic, recent reports of specific fungi and bacteria discovery have received scientific attention. In this process, this natural degradation method is safe for the environment and there are no hidden negative consequences for this approach.

By using less plastic products and switching to alternatives, plastic pollution can be reduced. Every year about 500 billion bags of about one trillion plastic bag are eaten around the world. It's more than a million minutes. Divorce in millions or millions of landfills every year now focus on one more important part of life that is eco-friendly: reducing the use of plastic. For example, the weight of the 2-liter plastic soft bottle has dropped to 51 grams from 1977 to 68 gm., resulting in 250 million pounds of waste stream using plastinum products and materials every year.

Various ways for sustainable use of plastics:

✓ Avoid plastic bottled water

- ✓ Eating ready-to-eat reduces the use of food and cans
- ✓ Buy baby bottles and Sippy cups or glass options
- ✓ Bring your own wardrobe bags to this groceries store or any store
- ✓ Keep your own reusable steel or ceramic beverage containers
- ✓ Do not buy plastic packaged food packages
- ✓ Buy bread or paper in package or goats
- ✓ Buy laundry detergents in the box, not the liquid in the plastic container
- ✓ Buy wholesale grains; bring your own paper bag
- ✓ For your garbage; reduce the use of plastic waste bags
- ✓ Small trash box in your home with a paper bag
- ✓ Use cloth to clean around the house
- ✓ Use matches in place of plastic straps-lighters
- ✓ Use cloth napkins. They reduce the use of your garbage and plastic garbage bags
- ✓ Use rechargeable batteries to reduce packaged battery purchases in plastic
- ✓ Use a refined cloth bag to work or to take your meal to school

Chemical Disintegration

Chemical decomposition for plastic pollution is the most efficient method. However, no technology has yet been developed to establish an economical and effective facility for the decomposition of plastics on a large scale. But chemical disintegration remains a field that has great potential for future development.

There are two main ways to disintegrate traditional plastic. One of them is plastic disintegration by microbes. Due to this relatively new discovery, however, there are no beneficial ways for sustainable use of plastic.

Alternative Solutions

Bio-degradable Plastic: This is the most sensible option for environmental sustainability. Polyhydroxyalkanoate (PHA) is the major component of BDP. It resembles conventional plastic in all aspects, with the added features of being able to naturally rot and break naturally in natural and safe by-products. So if all plastic waste in the city were bio geographical, then it could be allowed to rotate only with food and other non-recyclable, but bio degradable items such as beverage papers and cotton fibers [19].

Because BDPs are relatively new to production technology and are not generally known, the production costs are high. That is why there is more research in biodegradable plastics and more energy-efficient production methods, the hourly call [19]. For greener, healthy and better environment BDP is a progressive approach. The induction of biodegradable plastics is a promising and progressive future and is greatly reduced by fossil fuels. At the moment it is the only alternative to conventional plastic, but if it is completely replaced by traditional plastics, people should have no other option to use it by integrating biodegradable plastics into daily life, not only fossil fuels, but also agricultural producers who are interested in research and development of the natural agricultural industry. In addition to clear economic and ecological benefits, biodegradable plastics are also progressive from a scientific point of view. Apart from being usable for everyday purposes, biodegradable plastics also have a great opportunity to use the medicine field. Biodegradable plastics are a step ahead of the conventional plastic fact that they can be produced with renewable biomass instead of biofuels.

This is a big advantage because "renewable biomass", "agro industrial" waste not only is cheap, but their conversion solves other problems with waste products in useful products. This biodegradable plastic production also enables, which leaves no room for expansion of the crop. In return, they make profits in economic and ecological ways. Only limited content is available in existing biodegradable polymer technology. It is because of the limit that biodegradable plastics cannot yet go under normal conditions.
Bio-plastic: Bio-plastic is a plastic that consists entirely or partly of polymers, such as sugar cane, potato starch or organic sources such as trees, straw and cotton cellulose. Some bio plastics are extracted from the outside, others are made, so they help with enzymes in fertilizers, fungi, bacteria and industrial fertilizers.

Bio plastic is not entirely or partially formed, and no crude oil - is an effective way to preserve the benefits of conventional plastic, but reduces their disadvantages. However, this does not mean that bio plastics can prevent natural and biodegradable plastics. The main benefit is that it brings some relief to our endangered oil reserves.

As a result, more research focuses on the development of bio plastics, both of which are biodegradable and energy efficient.

The recovery is almost always more energy efficient and produces less carbon dioxide than the new product. A major problem in the recycling of bio plastics is that if they mix with oils, they can contaminate the entire batch.

V. CONCLUSION

In order to increase public awareness, the regional and national levels of education courses must include the waste management systems from the base as sources of information. In addition to creating public awareness about the importance of a healthy environment, mechanisms for controlling the production of waste at source are also recommended, alternative disposal methods, the creation of additional waste areas (landfills) and combustion mechanisms. Helping communities reduce their exposure to health toxicants increases the likelihood of a healthy society and clean environment for future generations.

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