

The Impact of Plastic Bags on Environmental Pollution

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Abstract : Millions of people using plastic bags for carrying goods, food items and many other things. People use plastic bags because they are cheaper in cost. Due to non-biodegradable nature they cause hazardous negative impact on the environment. Disposal of plastic waste which are major cause of environment pollution becomes carcinogenic to human, birth defects, impaired immunity, endocrine disruption, development and reproductive effect. In addition to dumping of plastic material into marine, a large number of species are known to be harmed or killed which could jeopardize their survival, especially since many are already endangered by other forms of anthropogenic activities. Creating public awareness on the importance of healthy environment, mechanism of controlling the generation of wastes at the source, alternative disposal ways, establishing additional drop-off-areas (land fills) and incineration mechanisms, plastic recycling facilities are also recommended.

Keywords: Plastic goods, hazardous plastic waste, anthropogenic activities.

Introduction

The word plastic is comes form the greek word 'plasticos' meaning molded or able to be shaped shape by heat. Plastic that are made up of polymers having only linear C atoms in their long chains. e.g.: poly propylene, poly ethene.

Plastics are a range of synthetic or semi-synthetic polymerization products that can be molded into a permanent object having the property of plasticity. Plastic are found extensive industrial applications. Plastics having a variety of properties are available at present. They have low specific gravities, ease of fabrication, resistance to low thermal and electrical conductivities. Many plastics can take range of colour to enable them useful for decorative purposes.

Plastic materials dumped into the earth prevent the production of nutrients in the soil. Because of this, the fertility of the soil is reduced and affects the agriculture sector. When its persistence in the environment can do great harm. It causes immune and enzyme disorders, hormonal disruption leading to endocrinal disorders and even infertility and is also considered as carcinogenic (cancer). Not only human health, it dangerously effects other animal life and alters the environment (air & water) sustainability causing hazardous pollution.

Classification

Plastics can divided into two general categories and they are 1.Thermoplastics and 2. Thermosetting plastics

1. Thermoplastics: Thermoplastics have either linear or branched structure and can be amorphous or semicrystalline materials. Polymeric chains are held together by weak vander waal's forces or dipole-dipole forces or hydrogen bonding and hence do not have cross-links. Thermoplastic soften on heating and harden on cooling because of weak vander waal's forces. These plastics can remoulded, reshaped and reused. Thermoplastics can be reclaimed from waste .examples for thermoplastic are cellulose derivatives, polyamides, polystyrene, polyvinyls, polyethylenes,etc.

2.Thermosetting plastics: Thermosetting plastics have three-dimensional, cross-linked, networked structures in which the polymeric chains are held together by cross-links(strong covalent bonds). These plastics donot soften on heating and they are hard, strong and more brittle. Thermosetting plastics cannot be remoulded and hence cannot be reused.examples for thermosetting plastic are phenolic resins(bakelite), polyesters(terylene), etc.

Disposal of Plastic

When plastics are used, recycled, or disposed of, or left in the environment as litter, they break down and release harmful chemicals. These pollutants include heavy metals such as cadmium and lead, and chemicals such as benzene, dioxins, and other pollutants, which all release harmful toxins into our air, water, and bodies. Right now, most plastic is being wasted sent to landfills or, more likely, incinerators.

Burning plastic in incinerators releases toxic heavy metals and chemicals. Incinerators produce a variety of toxic discharges to the air, water, and ground that are significant sources of powerful pollutants, including dioxin and other chlorinated organic compounds that are well known for their toxic effects on human health and the environment.

Many of these toxins enter the food supply and become more concentrated as they move up through the food chain. In addition to air and water emissions, incinerators create toxic ash—or slag—which contains heavy metals, dioxins, and other pollutants. This toxic ash must be land filled, and the pollutants present in the ash can then leach into groundwater.

In fact, garbage incinerators and medical waste incinerators are two of the largest sources of dioxin identified by the U.S.

Environmental Protection Agency. Dioxin is the common name for a class of 75 chemicals. It is a toxic waste product formed when waste containing chlorine is burned or when products containing chlorine are manufactured. Dioxins are among the most potent synthetic chemicals ever tested, causing cancer and harming our immune and reproductive systems even at very low concentrations.

In landfills, leachate is produced when water picks up toxins as it seeps through the trash. This trash includes plastics of all types, even older plastics that have been proven to be toxic but are still in our landfills. Although landfills attempt to collect this toxic leachate, it also leaks into ground and surface water, releasing pollutants into the environment and causing health risks for humans and wildlife.

Environmental Impacts

Environmental impacts are wide ranging and can be both direct and indirect. Direct impacts occur when marine life is physically harmed by marine debris through ingestion or entanglement (e.g., a turtle mistakes a plastic bag for food) or marine debris physically alters a sensitive ecosystem (e.g., a fishing net is dragged along the ocean floor by strong ocean currents and breaks and smothers a coral reef). Environmental impacts can also be indirect, such as when a marine debris cleanup results in ecological changes.

Toxicity Impact of Plastic Bags And Water Bottles

Accumulation of plastic bag wastes causes environmental pollution that can be manifested in number of ways such as deterioration of the natural beauty of an environment (Andrady 2003), death and entanglement of marine animals (Azzarello and Van Vleet 1987; Hofmeyr et al. 2006; Lithner et al., 2009), blockage of sewerage systems of cities and towns in developing countries (Adane and Muleta 2011) which in turn creates foul smells and favourable habitats for mosquitoes and other vectors that could spread various diseases like mosquitoes (Ellis et al. 2005), reduce percolation of water and proper aeration of agricultural soils which in turn results in a reduction of productivities of such fields (Njeru 2006).

Furthermore, in several poor and developing countries like Ethiopia, plastic bags are frequently used to carry food items and plastic water bottles as storage of different beverages like water, and soft drinks; food items like oil, milk, honey and other local food items and petroleum products such as benzene, Kerosene and naphtha. This practice can cause serious health problems due to some carcinogenic agents and cross contamination by microorganisms (Cliver 2006; Gerba et al. 2009; Kontominas et al. 2006; Lin et al. 2009). Moreover, it is common to use plastic bags for disposing of human and other domestic wastes which makes human health more risky as compared to “open” disposal of these wastes (Njeru 2006).

The Current Scenario

Plastic products have become an integral part of our daily life, encouraging its production to cross 150 million tonnes per year globally.¹ With its inception in 1957, the Indian plastics industry has also shown a significant growth and currently employs about 4 million people. It operates more than 30,000 processing units, of which 85 to 90 per cent are small and medium enterprises (SMEs). The utilization of plastics ranges from toys to aircrafts, from dolls to hosepipes, from soft drink bottles to refrigerators, from gramophone records to television sets. Packaging represents the single-largest sector of plastics use and accounts for 35 per cent of plastic consumption.

Conclusions:

To raise public awareness, the regional and national different levels of educational curriculums must include the waste management systems from the grass-roots as information resources. In addition to creating public awareness on the importance of a healthy environment, mechanisms of controlling the generation of wastes at the source, alternative disposal ways, establishing additional drop-off areas (landfills) and incineration mechanisms, plastic recycling facilities are also recommended. Helping communities to reduce their exposures to health toxicants will increase the likelihood for a healthy society and clean environment for the coming generations.

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