

Plastic Waste Management, an Emerging Stride for Environmental Protection

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Abstract - Plastic waste is an alarming problem all over the globe. The world is beginning to accept that it is time to tackle the plastic waste problem. . Currently, more than 30% of the world does not have access to proper collection and disposal of waste. Plastics are non-biodegradable, synthetic polymers. Since plastic does not decompose into a natural substance like soil, it degrades into tiny particles after many years. It releases toxic chemicals in the process of breaking down which make their way into our food and water supply. These poisonous chemicals are now found in the human bloodstream causing cancer, infertility, birth defects, impaired immunity and many other ailments. Some people are opposing the ban on usage of plastic products as it is effecting their lively hood. Therefore, the present article is focused on awareness on the dangers of usage of plastic products, plastic waste management techniques and government's intervention in plastic waste management.

Index Terms – Plastic waste, environment pollution, Human health, Government programs , plastic waste management.

INTRODUCTION

The world is brainstorming how to tackle the plastic debris as it is polluting the environment of the globe. Currently more than 30% of the world does not have proper and effective methods for collection and disposal of plastic waste. It is an alarming problem as more than one million marine animals are being killed in the ocean in each year due to plastic wreckage. Currently, it is estimated that more than 100 million of tons of plastic debris is existing in the oceans around the world. Bottled water has become an important source of plastic waste, along with single-use straws, cutlery, food containers and other plastic items. Plastic waste is clogging up landfills, blocking drains, polluting waterways and contributing to biodiversity loss. Plastic litter on roadsides and beaches and in other public spaces is an eyesore. PET has helped turn

water and other drinks into portable and lightweight consumer products. But PET takes hundreds of years to biodegrade. If incinerated, it generates toxic fumes. Hardly 18 percent of plastic waste is recycled globally. The rest ends up as garbage every year. A legal loophole is allowing an influx of PET bottles into the country, despite a ban on the import of plastic waste. *The present article is focused on awareness on the dangers of usage of plastic products, plastic waste management techniques and government's intervention in plastic waste management.*

REVIEW OF LITERATURE

Plastic was invented by Alexander Parkes in 1855 and named it as Parkesine. Celluloid. Polyvinyl chloride (PVC) was first polymerized between 1838-1872. Belgian-American chemist Leo Baekeland created Bakelite, the first real synthetic, mass-produced plastic in 1907.

PLASTIC POLLUTION

Plastics are non-biodegradable, synthetic polymers. They are made-up of long chain hydrocarbons with additives and can be moulded into finished products. These polymers are broken into monomers such as ethylene, propylene, vinyl, styrene and benzene, etc. Finally, the monomers are polymerised chemically into different categories of plastics. Petroleum-based plastic is not biodegradable. It usually goes into a landfill where it is buried or it gets into the water and finds its way into the ocean. Since plastic does not decompose into a natural substance like soil, it degrades (break down) into tiny particles after many years. It releases toxic chemicals (additives that were used to shape and harden the plastic) in the process of breaking down which make their way into our food and water supply. These poisonous chemicals are now

found in the human bloodstream causing cancer, infertility, birth defects, impaired immunity and many other ailments. The ingestion of microplastics is very dangerous for humans as these substances contain high concentrations of toxic chemicals such as polychlorinated biphenyls.

A major threat to oceans according to a 2017 International Union for Conservation of Nature (IUCN) report, micro plastics are estimated to constitute up to 30% of marine litter polluting the oceans. Henderson Island in the South Pacific is the most plastic polluted of any island recorded to date.

Some countries have taken measures such as subsidising plastic recycling companies and imposing a tax on plastic to reduce their usage etc. Some are of the opinion that Southeast Asia would probably become the new plastic recycling hub in the world. China's ban on import of plastic waste made Malaysia as big importer of plastic waste. It is developing unlicensed recycling factories mushroomed and many used environmentally harmful methods of disposal.

INDIA'S PLASTIC WASTE INDUSTRY

India recycles a higher percentage of plastic waste internally when compared to many countries in the world. One study found that more than 56% of plastic waste produced in India is recycled. The process of collecting and separating plastic waste is largely an informal sector activity, It is providing employment to many people in the unorganized sector. There is a huge gap between the production and recycling. According to the Government and industry estimates India consumes about 13 million tonnes of plastic and recycles only about 4 million tonnes. The root cause is the lack of an efficient waste segregation system and inadequate collection as much of the plastic not making its way to recycling centres.

Some manufacturers are recycling used plastic into pellets, which are then used to manufacture other plastic products, but the process comes with pollution risks. Plastic unsuitable for recycling is burnt, which releases toxic chemicals into the atmosphere. Some unsuitable plastics are used in landfill, potentially polluting soil and water sources. India has also emerged as one of the alternatives for recycling plastic waste. India recycles a higher percentage of plastic waste internally than other, richer countries. The

process of collecting and separating plastic waste is largely an informal sector activity, providing employment to many. As per the 2018 report of GAIA (an alliance that works towards alternatives to incinerators). The regulations to ban the usage of plastic waste in many states soon come undone. Ban of Plastic use in Maharashtra failed because of intense lobbying, lack of alternatives, and damage to the livelihood of those depending on manufacturing plastic and collecting plastic waste.

India banned the import of plastic waste, particularly PET bottles in 2015 because of an inability to recycle them. Experts suggest that most of the plastic waste does not make it to the recycling centres due to lack of an efficient waste segregation and inadequate collection. However, a subsequent amendment in 2016 allowed agencies located in Special Economic Zones to import plastic waste. India's imports of plastic scraps from China, Japan, Italy and Malawi for recycling and imports of PET bottle scrap and flakes has quadrupled.

SOCIETY'S RESPONSIBILITY

Plastic recycling is a crucial step towards a circular economy, but achieving circularity calls for action at every point in the lifetime of a product from design to waste management. Businesses ranging from fashion to hospitality are required to be more circular as they are redesigning the packing materials or using recycled material. Governments are redesigning the waste management systems making recycling of plastic waste more accessible for their citizens. As a part of this, they are focusing on six areas which provide several routes towards a rotund economy for ending plastic waste that causes environment pollution.

- Front- end design- Designing products that can last long and are easy to repair and eventually recycled.
- Access to collection of plastic debris- It is planning to facilitate basic infrastructure for convenience and necessary recovery of waste and preventing leakages in the environment in the collection process.
- Participation and engagement- Social awareness programmes are to be designed to educate people and inspiring them for the active participation in

sustainable practices and clean-up of plastic wreckage.

- Sorting of debris-The primary step of a recycling process is sorting waste according to type, (wet/dry), recyclable/non-recyclable and segregation of waste into plastic, paper, metal and glass from wreckage. This sorting should take place right inside the home and or at a formal place at waste management facilitator.
- Processing- Innovative and advanced scaling solutions are to be developed in recovery and recycling methods for both mechanical and chemical recycling.
- End markets- Quality of recycled products needs to be improved and are available at reasonable price. So that market demand for recycled products from all recycling methods would be increased.

Plastic waste management programmes- Some programmes are undertaken by all most all the countries in the world to protect the globe from environmental pollution for future generations.

- Transformation of plastic into affordable housing materials- Few initiatives are showing that plastic is used for manufacturing building materials as they have required properties such as light, moldable, tough and low price. Studies are showing that unemployed youth and women are engaged in collection transformation of plastic waste into eco-friendly building materials. One study showed that more than 117 affordable homes are constructed by converting three million plastic bottles in Uganda.
- Recycling package hundred percent- Currently, around 40% of plastic is used for packaging. However, Sealed Air, a packaging company, is planning to target 100% recyclable and reusable packaging products 2025. Some countries are putting plastic waste unsuitable for recycling into tank processors to get plastic derived fuel oil that is useful to close the loops. Tomra, a German company, is producing advanced recycling machines in exchange of soft drink containers. These plants are producing high quality polymers suitable for various purposes.
- Reduction in plastic consumption- It also producing the first food-grade film from

recyclable plastic. The glossy film is three times thinner than thermo formable film. It reduces the overall plastic consumption.

- Government/ Community initiatives- Several countries are working on reuse of the plastic debris. Steps are being taken by govt. bodies to reduce the cost recycling the plastic. Initiatives are being taken to buy the used plastic from locals grind it and sell it to recyclers.
- Introduction of Robots in recycling plants-AMP robotics is an innovative platform for separation of plastic from mixed waste for minimizing materials that are going waste due to improper segregation of mixed waste. Focus to be made to develop new artificial intelligence applications to improve the recovery facilities from mixed waste.
- Capture the plastic before it reaches to sea- Efforts are to be made to divert the materials to build and scale for other solutions currently, before they reach the sea. All these efforts will protect the environment and moves the society towards a sustainable circular economy by unlocking the value the waste. This can be achieved with the collective effort all the society.

PLASTIC WASTE MANAGEMENT (AMENDED) RULES, 2021

- Single use plastic shall be prohibited from 1st January 2022, Ear buds, balloons, plastic flags which are made from plastic sticks, candy sticks, ice cream sticks, thermocol for decoration.
- The Manufacture, import, stocking distribution and sale and use of single use plastic commodities are prohibited from 1st July 2022.

DAMAGE TO LIVELIHOOD AS A MAJOR GROUND FOR OPPOSITION IN INDIA

At present, the state has around 2,500 plastic manufacturing units, over 8,000 stores, nearly 12,000 small traders and 300 large distributors involved in the plastic manufacturing business. The manufactures want a waiver on packaging material till alternatives are identified and made available. "Food grains and food items including fruits and vegetables should be treated at par with milk and the state should extend the repository (50 paisa per bag) scheme on them

The plastic manufactures association has also sought a seven years' period to exit the business. They need reasonable time to make an ethical exit as they can't just sack out employees. It requires time to pay them gratuity and give them time to make alternative arrangements. Moreover, same industry may come up with an alternative to plastic. However, the government is sticking to its new regulations, but with exceptions already being declared and the difficulty in enforcing any complete ban, the best of intentions may not translate into effective results any time soon.

DATA ANALYSIS

A research instrument is served to elicit the opinion of marketers and customers on the usage of plastic products in general and plastic carry bags in particular,

1. Do you feel that is it cost effective to facilitate plastic carry bags to carry the products.

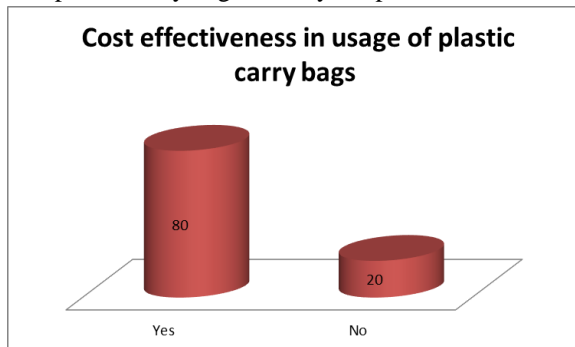


Fig. 1 shows that around 805 of the shop keepers are comfortable to facilitate the plastic carry bags as they are cost effective.

2. Would you like to facilitate plastic bags/ paper bags/ cloth bags to facilitate to the customers to carry the products.

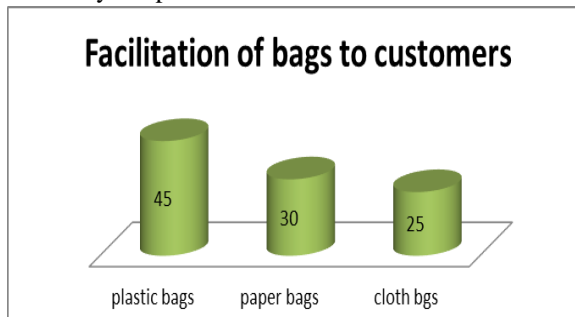


Fig.2 indicates that slowly the marketers are moving from plastic carry bags to paper bags and cloth bags, which is good sign for the reduction in the usage of plastic bags.

3. Would like to carry your bag / expect the bag from shop keeper when you go for shopping.



Fig, 3 shows that customers prefer the bag from shop keeper while purchasing the materials.

4. Can you eliminate / reduce the usage of plastic products at your house.

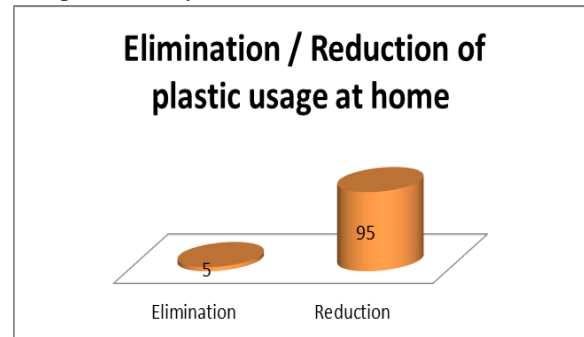


Fig. 4 indicates that very few respondents said that elimination of usage of plastic products is possible, with the development of alternative products. Majority of the respondents opined that usage of plastic products is inevitable as they are convenient and cost effective.

CONCLUSIO

Plastic is virtually irreplaceable, because it is cheap, strong, light weight and resistant to corrosion. The most common uses Of plastic are in packaging, building components, health care, sanitation, bio medical research products etc. Mostly, it is used for contamination and infection control. Some form of packaging is often necessary to maintain hygiene, freshness to maintain the integrity of the product during freight and affordable sanitation options for the home -less or low-income families. Reusable bags are more eco- friendly than paper and cotton alternatives. However, concerns remain regarding the widespread use of plastic. Though recycling is a good practice, the focus must remain in reduction of usage. An eco-friendly product, which is a complete substitute of

plastic in all cases has not been found till date. In the absence of any suitable alternative, it is neither practicable nor desirable to impose a complete ban on the usage of plastic all over the world. The real challenge lies in improving plastic waste management systems by focusing on 3 Rs- Refuse, reduce and recycle in specific order of priority of the public.

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