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Plastic Waste Management and Behavior Change

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Abstract

Plastic derives its name from the Greek term 'Plastics' which means capable of being shaped or mounded. The inventor of plastics never known the time of his invention the impact of plastics in the entire Earth. It is one of important primary need of people in day today life for all purpose using in different types of plastics materials. Plastics productions are more and more and appropriate disposable is troubling issues. Re usable of plastics products also not effective and byproducts of plastics can reusable of new plastic products and value of worth of money never aware by the people. The alternative commercial products for plastics manufacturing is very less and expensive to avail for use. There is no alternative for every products of plastics. It is developing field and trying to adopt few traditional practices such as leaf plates, mud glass and other newer products are trials for regular use. The entire Earth is filled as multilayered plastic sheets it affects the ground water, surface water and pollute the environment and health of living beings. For immediate step to prevent the worsen of plastic accumulation is reuse of plastics. Change the practice to use plastic plates and cups in daily life. Use of individual plate, glass, cloth/tissue piece or a small towel to wipe in each use and multi folded jute bag for purchase. Plan to use plastic containers and other products to reuse for daily needs to avoid the pollution and fossil fuel change the climates.

Keywords: Plastic Waste Management; Behavior Change; Single Use Plastics; Types of Plastics; Recycling & Up Cycling; Fossil Fuel; Climate Change.

Introduction

The environmental pollution is high priority to give attention to the issue to take some immediate steps. Changing behavior is not easy knowingly do the wrong things in day today activities. It is ever possible to monitor each individual, family, industry the uses and disposal of plastics to the environment unless people change their behaviors willingly to adopt right behaviors. Government implemented rules and regulations to corrective measures it need the entire system to support to success of the policy. Government given manpower and equipments and supply for effective waste management but the employees of Government/ Private and each individual put hands together for proper disposable of wastes from house, street, rural or urban, districts, states of the country. The manufacturer of plastics and industrial owners are major role to follow the policies of waste

management. The manufacturers and industrialists whom violating the rules are surprisingly very less number of cases registered and paid the minimal penalty of some money and released them within short time duration. The policy should be very strict for everyone rich or poor the imprisonment may be very severe.

The Historical Background of the Plastics

Plastic derives its name from the Greek term 'Plastics' which means capable of being shaped or mounded. It has replaced a broad range of traditional materials and found innumerous applications ranging from everyday single-use products such as packaging and bottles to long-lasting furniture, clothes, automotive components, and building materials.[1]

The First Synthetic Plastics by the middle of the 19th century, in the wake of industrialized goods production, some animal derived materials had become increasingly scarce. Elephants were facing extinction of demand for their ivory, used in items from piano keys to billiard balls, continued the products based on requirement. The same fate awaited some species of turtle, whose shell was harnessed for combs.

The inventor, the Birmingham born artisan cum chemist Alexander Parkes, patented this new material in 1862 as Parkesine. Considered the first manufactured plastic, it was a cheap and colorful substitute for ivory or tortoise shell usage.

The 20th century went a revolution in plastic production the advent of entirely synthetic plastics. Belgian chemist and clever marketer Leo Baekeland pioneered the first fully synthetic plastic in 1907. His invention, which he would christen Bakelite, combined two chemicals, formaldehyde and phenol, under heat and pressure. Bakelite sparked a consumer boom in affordable yet highly desirable products. It had a dark brown, wood like appearance but could be easily mass produced, making it ideal for bringing new design trends such as Art Deco to the masses.

The Global Production and Disposable of Plastics

Once proved to be a miracle, plastic has become a peril to nature in several terms that affect marine life to land resources. Plastics have outgrown most manufactured materials and have long been under environmental scrutiny. However, despite several technological advancements, the end of life of plastic is still lacking. Between 1950 – 2015, the cumulative production of polymers, synthetic fiber and additives was 8300 million tons, of which 4600 million tons (55 percent) went straight to land fills or were discarded, 700 million tons (8 percent) incinerated, and only 500 million tons (6 percent) was recycled. By 2050, as per current production and waste management trends, had it continued at the same rate, it would have generated 12,000 million tons.[2]

End of Life Management and Mitigation of Plastic Waste Pollution in India.

While environmentally friendly biodegradable plastics are a desirable solution, it is essential that they also fulfill required functional performance parameters (i.e. moisture barrier, heat sealability. The Indian plastics industry started in 1945 and has been growing over the years. From 0.9 million tons in 1990 to 18.45 million tons in 2018, plastic consumption has grown 20 times since then.[3]

Fig. 1: Plastic Hazards

Single Use plastics (SUP), often referred to as disposable plastics, are commonly used for plastic packaging and include items intended to be used only once before being thrown away or recycled. They are non-biodegradable and harm our health, wildlife, and the environment. They take years to disintegrate and further break down into smaller pieces of plastics known as micro plastics contaminating food and water, including oceans.[4]

In 2019, Prime Minister Shri Narendra Modi issued a call to phase out SUP by 2022. Subsequently, the government has adopted a three pronged approach in tacking this problem, viz. behavioral change, institutional mechanisms, and extended producer responsibility. The Government of India (GoI) has considered and enacted a range of environmental legislation governing plastics, particularly on the end-of-life management and mitigation of plastic waste pollution.

Environmental Impacts of Plastics

Most global plastics waste is generated in Asia but the US, the EU, and Japan lead in terms of per capita plastic packaging waste. Between 1950-2015, the cumulative production of polymers, synthetic fibers and additives was 8300 million tons, of which 4600 million tons (55 percent) went straight to land fills or were discarded, 700 million tons were incinerated.

Plastic over consumption and mismanagement is a growing menace across the globe and is leading to overflowing landfills, blocked rivers, and threatened marine ecosystems. This has a negative impact on sectors that are critical to many economies, including tourism, shipping, and fisheries. There are the hundreds of thousands of landfills, drains and rivers choked with plastic waste, especially in the developing world.[5]

The production and disposal of plastics are also responsible for significant greenhouse gas emissions. In addition, the loss of natural resources resulting from current waste management systems represents a missed economic opportunity. For example, estimates suggest that 95% of the material value of used plastic packaging, or USD 80–120 billion, is lost annually. Nearly every piece of plastic begins as a fossil fuel, and greenhouse gases (GHG) are emitted at each stage of the plastic lifecycle 1) fossil fuel extraction and transport, 2) plastic refining and manufacture, 3) managing plastic waste, and 4) ongoing effects within oceans, waterways, and various ecosystem landscapes.[6]

As per a recent CIEL report[17], at current levels, Greenhouse gas emissions from the plastic lifecycle threaten the ability of the global community to keep global temperature rise below 1.5°C degrees. If plastic production and use grows as currently planned, by 2030, these emissions could reach 1.34 gigatons per year, equivalent to the emissions released by more than 295 new 500 megawatt coal-fired power plants. By 2050, the cumulation of these greenhouse gas emissions from plastic could reach over 56 gigatons, or 10 – 13% percent of the entire remaining carbon budget.

Emissions Reduction Through Recycling and Up Cycling

Waste management generates greenhouse gases both directly and indirectly. Direct emissions are generated

i. During waste collection and transportation.
ii. During waste pretreatment (sorting, crushing etc.).
iii. In waste utilization processes.[7-9]

Solutions emerging technologies to prevent and collect marine plastic pollution environment in international,

i. In landfills during decomposition.
ii. In waste combustion.
iii. In biological treatment.

Additionally, indirect greenhouse gas emissions are connected to waste through other functionssuch as

i. Energy consumption related to the production, transportation and use of the material.
ii. Emissions from production processes (not related to energy consumption).
iii. Emissions from the production and transportation of the raw materials for the products.

Material recycling can also decrease both direct and indirect greenhouse gas emissions. Globally, the energy savings from plastic waste recycling are estimated to be 3.5 billion barrels of oil, equivalent to about $176 billion dollars. Upcycling processes provide new methods to handle real-world plastic wastes, which cannot be exposed to thermo mechanical recycling. Hence, there is no uncertainty that plastic waste upcycling would contribute to the mitigation of solid waste contamination and the manufacture of high-value products simultaneously, thus, leading to considerable economic and scientific opportunities.

Both recycling and upcycling are designed for the valorization of post-consumer plastic wastes to stop the emission of plastic wastes into the natural environment.[10,11]

Type of Plastics

Plastics can be broadly split into two groups, those that consist of long strands (thermo softening) and those that also contain short cross-links (thermosetting). Thermo softening plastic will deform when heated and can be remolded into new shapes. Thermosetting plastics are much stronger, but once they have been formed into a shape, they will hold that shape indefinitely, and if heated they will merely burn.

Table I: Types of Plastics

Type (Resin identification code)	Plastics	Common Uses
1	PET	Poly Ethylene Terephthalate – Fizzy drink bottles and oven-ready meal trays.
2	HDPE	High -Density Poly Ethylene – Bottles for milk and washing- up liquids, milk bottles, bleach, cleaners and most shampoo bottles.
3	PVC	Poly Vinyl Chloride – Food trays ,cling film, bottles for squash, mineral water and shampoo, pipes, fittings, window and door frames (rigid PVC); thermal insulation (PVC foam) and automotive parts
4	LDPE	Low Density Poly Ethylene – Carrier bags, bin liners and packaging films
5	PP	Poly Propylene – Margarine tubs, microwaveable meal trays, also produced as fibres and filaments for carpets, wall coverings and vehicle upholstery.
6	PS	Poly Styrene – Yoghurt pots, foam meat or fish trays, hamburger boxes and egg cartons, vending cups, plastic cutlery, protective packaging for electronic goods and toys, insulating material in the building and construction industry.
7	Other	Any other plastics that do not fall into any of the above categories. – An example is melamine, which is often used in plastic plates and cups.

Source : Adapted and modified from Isangedighi Asuquo, Gift Samuel David & Of onmbuk Obot[12]

1. **Poly Ethylene Terephthalate (PET)**

   Typically used to make bottles for soft drinks, water, juice, mouthwash, sports drinks and containers for condiments like ketchup, salad dressing, jelly and jam, PET is considered safe. One study that looked at 63 brands of bottled water produced in Europe and Canada found concentrations of antimony that were more than 100 times the typical level found in clean groundwater (2 parts per trillion).

   It also found that the longer a bottle of water sits on a shelf in a grocery store or your refrigerator the greater the dose of antimony present. It is believed that the amount of antimony leaching from these PET bottles differs based on exposure to sunlight, higher temperatures, and varying pH levels. Brominates compounds have also been found to leach into PET bottles. Bromine is known to act as a central nervous system depressant, and can trigger a number of psychological symptoms such as acute paranoia and other psychotic symptoms.

2. **High Density Poly Ethylene (HDPE)**

   HDPE, which is considered a low hazard plastic, is often used for milk, water and juice bottles, as well as bottles for cleaning supplies and shampoo. It's also used to make grocery bags and cereal box liners. HDPE (like most plastics) has been found to release estrogenic chemicals.In one study, 95 percent of all plastic products tested were positive for estrogenic activity, meaning they can potentially disrupt your hormones and even alter the structure of human cells, posing risks to infants and children. In this particular study, even products that claimed to be free of the common plastic toxicant bisphenoI A (BPA) still tested positive for other estrogenic chemicals.

3. **Poly Vinyl Chloride (PVC)**

   PVC plastic can be rigid or flexible, and is commonly found in bags for bedding, shrink wrap, deli and meat wrap, plastic toys, table cloths and blister packs used to store medications. PVC contains toxic chemicals including DEHP, a type of phthalate used as a plastics softener. Phthalates are one of the groups of "gender bending" chemicals causing males of many species to become more female.These chemicals have disrupted the endocrine systems of wildlife, causing testicular cancer, genital deformations, low sperm counts and infertility in a number of species, including polar bears, deer, whales and otters, just to name a few.

   Scientists believe phthalates are responsible for a similar pattern of adverse effects in humans as well. If your home contains soft, flexible plastic flooring, such as vinyl or those padded play mat floors for kids (often used in day cares and kindergartens, too), there's a good chance it is also made from toxic PVC. PVC flooring has been linked to chronic diseases including allergies, asthma and autism.

4. **Low Density Polyethylene (LDPE)**

   Another plastic that is considered a low hazard, LDPE is used in bags for bread, newspapers, fresh produce, household garbage and frozen foods, as well as in paper milk cartons and hot and cold beverage cups. While LDPE does not contain BPA, it may pose risks of leaching estrogenic chemicals, similar to HDPE.

5. **Poly Propylene (PP)**

   PP plastic is used to make containers for yogurt, deli foods, medications and takeout meals. While polypropylene is said to have a high heat tolerance making it unlikely to leach chemicals, at least one study found that PP plastic were used for laboratory studies did leach at least two chemicals.

6. **Poly Styrene (PS)**

   Polystyrene, also known as Styrofoam, is used to make cups, plates, bowls, take-out containers, meat trays and more Polystyrene is known to leach styrene, which can damage your nervous system and is linked to cancer, into your food. Temperature has been found to play a role in how much styrene leaches polystyrene containers, which means using them for hot foods and beverages (such as hot coffee in a polystyrene cup) may be worst of all.

7. **Other**

   This is a catch all designation used to describe productmade from other plastic resins not described above, or those made from a combination of plastics. It's difficult to know for sure what types of toxins may be in 7 plastics, but there's a good chance it often contains BPA or the new, equally concerning chemical on the block in the bisphenol class known as Bisphenol-S (BPS). BPA and BPS are endocrine disrupters, which means they mimic or interfere with your body's hormones and "disrupts" your endocrine system The glands of endocrine system and the hormones they release are instrumentalin regulating mood, growth and development, tissue function, metabolism, as well as sexual function and reproductive processes.

   Some of the greatest concern surrounds early life, in utero exposure to bisphenol compounds, which can lead to chromosomal errors in developing fetus, causing spontaneous miscarriages and genetic damage. But evidence is also very strong showing these chemicals are influencing adults and children, too, and leading to decreased sperm quality, early puberty, stimulation of mammary gland development, disrupted reproductive cycles and ovarian dysfunction, cancer and heart disease, among numerous other health problems.

Recycled Plastic into Useable Products

The following types of plastics are converted into useable products.

1. PET is recycled to make apparel, blankets, carpets, tote bags, other winter wear like fleeces, containers for food, beverages, automotive parts, film, strapping and industrial end-use items (e.g. geotextiles and roof insulation).
2. PP and HDPE are often collected by local scrap dealers to recover the costs of collection, sorting and pre-processing. The PP is further divided into several categories such as colored, mixed color, white, transparent and other recycling categories. The resin in each category is the same. However, it requires sorting post collection and is subject to independent unit operations. The value and demand for transparent PP are pretty high.

3. PVC can be divided into rigid PVC, soft PVC and footwear. Chlorinated PVC is considered to be a lower grade of PVC as compared to unplasticized PVC as it degrades after undergoing recycling. Also, as the PVC plastics go through the process of recycling, the color of the plastic starts to turn grey, which darkens further as the PVC plastic undergoes more iterations of the recycling process.
4. Polycarbonates are thermoplastics bought by the scrap dealers at a rate of Rs 50/kg, and they are used in engineering as they are rigid materials, and some grades are optically transparent, which makes them display properties of glass without the brittleness. This optical transparency gets diminished over multiple cycles of recycling, but it can still be used for engineering purposes. Nylon, which is also known as Poly Amide (PA), is widely used in household plastic items like clothing and toothbrushes and also has industrial uses like in conveyor belts and as machinery parts. It is usually procured along with various types of plastics and then sub-segregated and sorted manually to be further sold to processors at a rate of Rs 20–35/Kg depending on the type and quality of the material.[13]

The list of banned items includes:

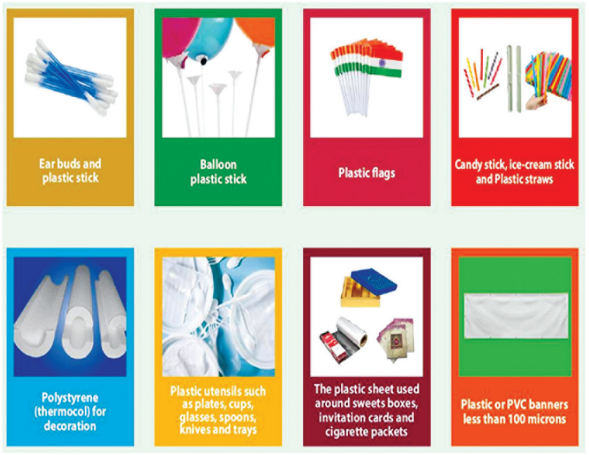
1. Ear buds with plastic sticks
2. Plastic sticks for balloons
3. Plastic flags
4. Candy sticks
5. Ice-cream sticks
6. Polystyrene (Thermocol) for decoration
7. Plastic plates
8. Cups
9. Glasses
10. Cutlery such as forks
11. Spoons
12. Knives
13. Straw
14. Trays
15. Wrapping or packing films around sweet boxes
16. Invitation cards
17. Cigarette packets
18. Plastic or PVC banners less than 100 micron
19. Stirrers

Single Use Plastics

In the 4th UN Environment Assembly held in 2019, India piloted a resolution on addressing SUP product pollution, recognizing the urgent need for the global community to focus on this fundamental issue. During India's Independence Day speech in 2019, Prime Minister Shri. Narendra Modi had pledged to make India free of SUP by 2022.

MoEF & CC notified the PWM Amendment Rules on 12th August 2021, which prohibits identified SUP items with low utility and high littering potential by 2022. The manufacture, import, stocking, distribution, sale, and use of the following SUP, including PS and expanded PS, commodities shall be prohibited with effect from the 1st July 2022.

The Government of India has taken Resolute Steps for Mitigation of Pollution caused by



Plastic Alternatives

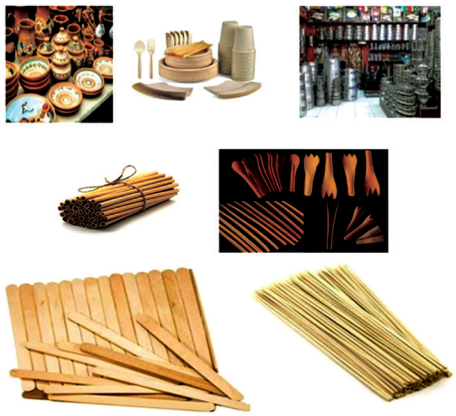


Fig. 2: Plastic Policy 2022 Government of India

Littered Single Use Plastics

The Plastic Waste Management Amendment Rules, 2021, also prohibit manufacture, import, stocking, distribution, sale and use of Plastic Carry Bags having thickness less than 75 microns with effect from 30th September, 2021, and having thickness less than thickness of 125 microns with effect from the 31st December, 2022.[14,15]

To stop littering due to lightweight plastic carry bags, with effect from 30th September 2021, the thickness of plastic carry bags has been increased from 50 microns to 75 microns and 120 microns with effect from 31st December 2022.[16]

Some of the other sustainable alternatives that should be considered to deal with plastic waste are to use of biodegradable plastics, biodegradable bioplastics, and compostable plastics. These provide an alternative to conventional plastic usage, though often, there is confusion about the differences among the terms bioplastics, biodegradable plastics, compostable plastics, and oxo-degradable plastics.

1. **Bio-Plastics**

   Encompass many materials that are either bio-sourced or biodegradable or both and are made from renewable biomass resources, most often corn starch/ sugarcane/ cassava which might be either biodegradable or not.

2. **Biodegradable Plastic**

   Means that plastics, other than compostable plastics, which undergo complete degradation by biological processes under ambient environmental (terrestrial or in water) conditions, in specified time periods, without leaving any micro plastics, or visible, distinguishable or toxic residue, which has adverse environment impacts, adhering to laid down standards of BIS and certified by CPCB.

3. **Compostable Plastics**

   Mean plastics that undergo degradation by biological processes during composting to yield CO2, water, inorganic compounds and biomass at a rate consistent with other known compostable materials, excluding conventional petro-based plastics, and do not leave visible, distinguishable or toxic residue. These can be plant- based, but can also be petroleum-based as well. BASF's Ecoflex® is an excellent example of a compostable polymer, which is partly petroleum-based but is compostable at industrial compost facilities.

4. **Oxo-Degradable/ Oxydegradable/ Oxo-Biodegradable**

   Plastics are conventional plastics such as PE, which include an additive to help them break down into smaller fragments, which could lead to microplastic leakage in the environment.

Global Action on Plastic Alternatives

Various governments across the world have come up with creative policies to mitigate the plastic threat; for instance, since 2004, the government of Luxemburg, along with Valorlux, has replaced the country's SUP bag with the Öko-Tut, an eco-sac reusable bag. This resulted in an 85% drop in plastic consumption in the first nine years of the initiative. This has cut down on the use of 1.1 billion SUP bags.

Costa Rica planned to eliminate plastic bags, bottles, cutlery, straws, and coffee stirrers by 2021. The objective was to replace 80% of the country's disposable plastic packaging with non-petroleum renewable materials that can biodegrade within six months, even in a marine environment. Renewable choices include cassava bags, sugar cane takeaway boxes, and wooden coffee stirrers. By 2017, the country discarded 1.5 million plastic bottles every day.

The Government of Baja California, Mexico, passed a restrictive law to reduce SUP. Alternatives in the region include straws made of agave fibers or avocado pits, cutlery made of cornstarch, Kraft paper bags, Green ware cups and containers made from plants, and hot beverage cups made of bamboo fibers and waxed with PLA, all of which are certified to be 100% compostable.

Edible Seaweed Cups

Seaweed can grow up to 60 times faster than land-based plants, making it an important carbon sink. An Indonesian company, in 2016, in response to the plastic waste crisis, made edible seaweed cups under the ElloJello brand that come in various colors and flavors, from orange to green. The company also produces edible food wrapping and single-use sachets, typically used for instant coffee or food

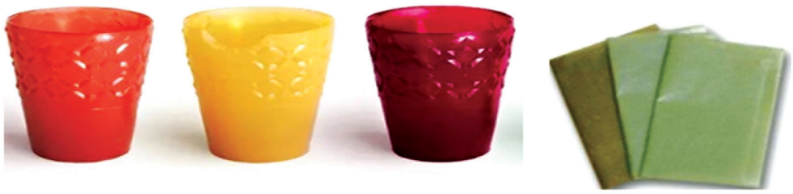


Fig. 3: ElloJello edible cups and packaging

condiments. [17,18]

Algae-Blended Ethylene-Vinyl Acetate

A US based firm has created algae-blended ethylene-vinyl acetate transforming air and water pollution(ammonia, phosphates, and carbon dioxide) into plant biomass rich in proteins. The material called Bloom, a bouncy and flexible foam is used in the soles of most shoes (Fig. 16). It replaces the incumbent material traditionally made from petroleum.

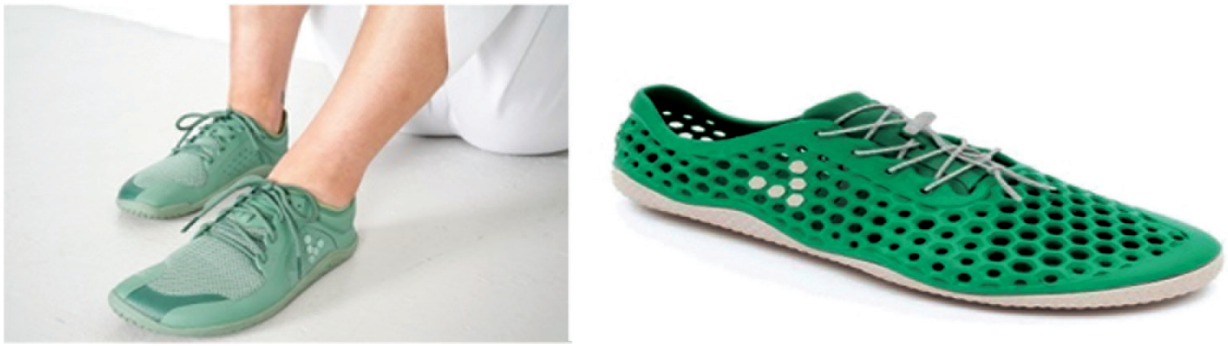


Fig. 4: Shoeproductsusing Bloomalgaefoam

Fig. 5: Time lapse images of strawberry with lipid coating

Lipids and Glycerolipids Coating

A California based company has formulated a plant derived (lipids and glycerol lipids) edible, odorless, colorless, and tasteless coating. This can help in eliminating the packaging of fruits and vegetables and increasing the shelf life.

Zero Plastic Recycled Paper Bottle

A UK firm has invented the only commercially available zero plastic recycled paper bottle in the world. From seal packing to the inner lining of the bottle, everything is made from a sustainably

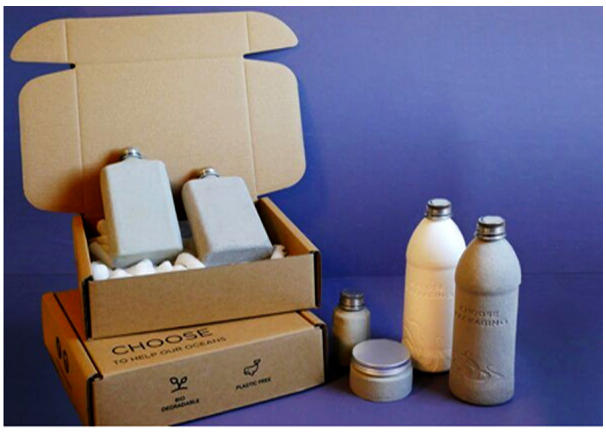


Fig. 6: Zero plastic paper packaging bottle

sourced material. Feasibility studies are carried out to design for each product and use across multiple industries, from pharmaceutical & cosmetics to foodstuffs & drinks and home care and cleaning products. The company was recently acquired by HP Inc. [19,20]

London based startup has made seaweed based sustainability packaging material that is entirely biodegradable and edible and that can be home composted in 4-6 weeks (Fig. 19). So far, the packaging has been used to create thin films and coatings for cardboard, takeaway boxes, as well as sachets for condiments.

Edible Packaging Products

Fig. 7: Edible/biodegradable packaging products

Wood-Based Paper Packaging

In 2020, a Scotland based paper manufacturing company developed a sustainable wood based alternative to plastic packaging. It is a translucent, functional barrier paper that preserves the quality of food and cosmetics just as well as conventional plastics while ensuring a limited impact on the environment. This pioneering paper is fully recyclable, compostable, bio-degradable, and offers a sustainable alternative to SUP packaging.[21,22]

Implementation Status of Extended Producer Responsibility (EPR)

The guidelines have recognized and included biodegradable plastics, as certified by regulatory entities Central Pollution Control Board, BIS,

Table II Plastic Waste Management Rule

1.	IS/ISO14851:1999 Determination of the ultimate aerobic biodegradability of plastic materials in an aqueous medium-Method by measuring the oxygen demand in a closed Respirometer
2.	IS/ISO14852:1999 Determination of the ultimate aerobic biodegradability of plastic materials in an aqueous medium-Method by analysis of evolved carbon dioxide
3.	IS/ISO14853:2005P lastics-Determination of the ultimate a naerobic biodegradation of plastic materials in an aqueous system-Method by measurement of biogas production
4.	IS /ISO 14855-1: 2005 Determination of the ultimate aerobic biodegradability of plastic materials under controlled composting conditions- Method by analysis of evolved carbon dioxide (Part-1 General method)
5.	IS/ISO14855-2:2007 Determination of the ultimate aerobic biodegradability of plastic materials under controlled composting conditions-Method by analysis of evolved carbondioxide (Part-2: Gravimetric measurement of carbon dioxide evolved in a laboratory- scale test)
6.	IS / ISO 15985: 2004 Plastics- Determination of the ultimate anaerobic biodegradation and disintegration under high-solids a naerobic digestion conditions-Methods by analysis of released biogas

7.	IS/ISO16929:2002 Plastics- Determination of degree of disintegration of plastic materials under defined composting conditions in a pilot - scale test
8.	IS/ISO17556:2003 Plastics- Determination of ultimate aerobic biodegradability in soil by measuring the oxygen demand in a Respirometer or the amount of carbon dioxide evolved
9.	IS/ISO20200:2004 Plastics-Determination of degree of disintegration of plastic materials under simulated composting conditions in a laboratory - scale test
10.	The degree of degradability and degree of disintegration of compostable and biodegradable plastic material shall be as per the protocols

Central Institute of Petrochemicals Engineering & Technology, for adoption and will be exempted from EPR targets. The PWM Rules 2016 stress the minimization of plastic waste, segregation at source, recycling, and implementing the polluters pay principle for the sustainability of the waste management system.

Conclusion

The major drawback of plastics it is harmful to health of all living beings and entire Earth. The plastics is going on spread over the Earth to stop the plastics use only through the right actions. There is no sufficient alternatives of plastics is major issue in current scenario. Substitutes products are not available freely and inexpensive and also it is not affordable buy every one. Few suggestions to follow in each individual carry a small bag for drinking cup (for water, juices, tea, coffee) a plate (for food, snacks) after washing the cup and plate use the piece of tissue paper or cleaned cloth for wiping each use for everywhere. Carry a multi folded jute bags for purchasing groceries to avoid to use plastics on daily basis. It is possible to reduce the use of disposable cups and plates and plastic bags somewhat without alternatives. Reusable of plastics is next consideration for each individual and family to reuse effectively the plastics before disposable. Recycling machineries are required in small size and to be used in each unit of the society.

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