

## Beating plastic pollution

A boy walks across plastic refuse dumped at south Delhi's Taimoor Nagar drain on Tuesday. June 5 is marked by the United Nations as World Environment Day. | Photo Credit: [Shiv Kumar Pushpakar](#)

We celebrated '[World Environment Day](#)' (June 5) with a critical theme: beat plastic pollution. Since India was the global host of this year's event, and also one of the victims of plastic pollution, we should view this danger seriously. The theme urges governments, industries, communities and individuals to come together and explore sustainable alternatives. It also urges this target group to reduce the production and excessive use of single-use plastics, which are polluting our environment and threatening human health.

### Life in plastic: on waste management framework

Plastics are organic polymers of high molecular mass and often contain other substances. They are usually synthetic, mainly derived from petrochemicals. Due to their low cost, ease of manufacture, versatility, non-corrosiveness and imperviousness to water, plastics are used for multiple purposes at different scales. Plastic was invented in New York in 1907 by Leo Baekeland. Further, many chemists, including Nobel laureate Hermann Staudinger (father of polymer chemistry) and Herman Mark (father of polymer physics), have contributed to the materials science of plastics. However, these scientists could not have anticipated such an exponential growth of plastic production.

Plastic has become an indispensable material in modern society. Worldwide, one million plastic bags and one million plastic bottles are used every minute. About 50% of our plastic use is single use (disposable) and it constitutes 10% of the total waste generated. More than 9.1 billion tons of plastic are said to have been "manufactured since the material was initially mass-produced in the 1950s". In 2015, scientists said that "of the nearly 7 billion tons of plastic waste generated, only 9% was recycled, 12% incinerated, and 79% accumulated in landfills or the environment".

### To be an environmental world power

In India, which accounts for almost 18% of the world population in 2.4% of the global land area, the accumulation of plastic waste is huge. An estimate in 2015 revealed that 60 cities across the country generated over 15,000 tonnes of plastic waste every day. Even if plastic is a convenient alternative, it is a difficult substance for nature to digest.

Each year, 13 million tonnes of plastic end up in the oceans. A study revealed that 20 rivers (mostly from Asia) carry two-thirds of plastic waste to the ocean; the Ganga's contribution to this is one of the highest. Researchers exploring the Arctic have found very high levels of microplastics trapped in the ice. Last year, a plastic spoon was found in the remains of a whale shark off Rameswaram. Experts explained that whale sharks are filter feeders and like to swallow everything floating in the sea. The economic impact of plastic pollution on marine ecosystems through fisheries and tourism losses and beach cleaning-up costs is estimated to be around \$13 billion per year.

Plastic disposed of on land degrades slowly and its chemicals leach into the surroundings. Drinking water samples analysed from 14 countries, including India, revealed that 83% have micro-plastics concentrations. According to a United Nations Environment Programme report, the overall annual natural capital cost of plastic use in the consumer goods sector is \$75 billion.

In reality, we cannot eliminate plastic use from our day-to-day activities. However, we should not allow plastic to reach the soil or water. The government should restrict plastic production and encourage recycling through appropriate policies. The 'Plastic Waste Management Rules 2016' need to be strictly followed.

As most plastic items pass through our hands, public care, with behavioural change, is necessary. Household-wise waste segregation is the key. We should act as responsible citizens with a determination towards maintaining cleaner surroundings. Every shopkeeper should go in for and encourage the use of biodegradable packing materials while shoppers should use cloth bags. Mass public awareness on the dangers of plastic hazards is a prerequisite.

Eco-friendly substitutes (cloth/paper/jute bags, leaves/areca leaf plates, paper straws) should be developed. For this, scientific and financial support (soft loans and subsidies) is required. Charges for plastic bag use and deposit-refund for plastic bottles may be effective options. The recent decision by the Cabinet Committee on Economic Affairs on extending the mandate on packing food grains and sugar products in jute bags is welcome. Even if the intention is to promote the jute industry, it is a step that reduces plastic pollution. The Swachh Bharat Mission should emerge as a platform for plastic waste management.

We cannot transform our world into a 'plastic planet'. What is needed is collective public effort to stop plastic pollution and safeguard our ecosystem/biodiversity.

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