

The Health Impact Of Waste



Remember the Surat Plague? It was caused by municipal waste that was left uncollected on streets for many days. Flies, pigs, rodents, mosquitoes that we see on garbage piles can carry deadly diseases such as plague, dengue and malaria to the community.

Solid waste has the potential to degrade our air, land and water if it is not managed properly. In cities we are all familiar with drains getting clogged by garbage leading to insect breeding and flooding during rains.

Garbage burning contributes significantly to urban air pollution. Greenhouse gases like methane are generated from decomposition of organic wastes in landfills and untreated leachate pollutes surrounding soil and water bodies.

Wildlife and humans around the world carry amounts of Persistent Organic Pollutants (or POPs) in their bodies that are near levels that can cause harm.

Human fecal matter, commonly found in municipal waste, attracts insects and rodents that spread diseases such as cholera and dengue fever. Using water polluted by solid waste for bathing, irrigation and drinking can also expose individuals to disease and skin infections.

Hidden in our waste are also all kinds of deadly chemicals that persist in the environment for decades, or even longer. They cause a large variety of diseases such as cancers, diabetes, rashes, allergies, birth defects, hormonal disruptions, retardation of growth and damage to the liver and kidneys.

Our cities also face a threat from medical waste, toxic waste such as discarded fluorescent tubes and bulbs, used pesticide cans and plastics. Let us get to know the enemy a little better.

Medical Waste



Medical waste ultimately ends up with municipal waste. Medical waste is rich in bacteria and blood-borne pathogens that can multiply very easily in municipal waste which has a high organic content. Discarded syringes, needles, bandages, IV bottles and blood bags can be extremely dangerous if not segregated and treated before disposal. Blood contaminated bandages and used needles are a potential source for Hepatitis B and C.

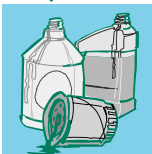
Discarded Products



Products such as fluorescent tubes contain mercury, a potent neurotoxin which affects the central nervous system. Mercury can leach out of discarded bulbs and tubes or even be inhaled as vapour when such waste is burnt. Acute effects may include severe gastrointestinal damage, cardiovascular collapse or kidney failure, all of which could be fatal.

Insecticides used in our homes to get rid of mosquitoes, insects or flies are also extremely harmful. Popular brands of pesticides contain deadly chemicals such as Deltamethrin, Allethrin and Propoxur. Besides, they also use kerosene as solvents and LPG as a propellant in spray cans. Residues of these items from discarded containers tend to leach into the underground water and the soil. Exposure to these items can result in dizziness, fatigue and blurred vision while chronic exposure may result in learning disabilities and disturbance in concentration. Allethrin also may cause cancer.

Impact of Plastics



Though discarded plastic bags and containers seem harmless, the reality is that PVC used to make pipes, slippers, toys, insulations for wires is toxic both at the production and disposal stage. PVC when burnt produces dioxins, highly toxic chemicals that result from the incineration of municipal waste and burning garbage in the backyards which is high on chlorine content.

Plastic bags lying out in open dumps and landfills may contain cadmium and other heavy metals that react with municipal waste and leach into soil and water, rendering them unfit for use.

Landfills – Postponing Disaster

A landfill, as the name suggests, is the result of the filling up of land with garbage. Ideally, a municipal landfill should have non-hazardous waste disposed of in a series of compacted layers covered with soil, clay or plastic foam. Such a landfill is called a secured landfill. None of the municipal landfills in our country are secured; they are just huge dumping grounds where thousands of tonnes of waste of every kind are dumped. Landfills remain the most widely used methods of getting rid of municipal solid waste worldwide. But are they really the best solution? No!

Most of the garbage that we generate is unsuitable for landfills. In Delhi, which generates about 7,000 tonnes of waste every day, more than 90 per cent ends up in landfills. Of this, 60 per cent is biodegradable organic waste that can be composted; about 15 per cent is recyclable waste like paper, plastic, metals, etc. Construction debris and ash comprise about 25 per cent of it and can be ground for use. This leaves just 1 per cent of waste, consisting of PET



bottles, tetrapacks and non-recyclable poly bags, that needs to be put in landfills.

Landfills are not a solution to our problems of waste disposal but rather a problem in themselves. The garbage dumped into landfills continues to pollute and be a nuisance. High organic content in municipal waste results in the formation of leachate. Leachate is a liquid resulting from decomposition and from rainfall percolating through a landfill. Decomposition can also break down solid items into liquid forms. Anaerobic bacteria in the landfills can corrode the metal casing of batteries, allowing the heavy metals inside the battery to leak out.

The leachate along with percolated water travels down by force of gravity and ends up mixing with underground water and soil, polluting them. According to the European Union, leaching from landfills can be a major source of dioxin pollution in the future.

During decomposition of waste, methane is also produced. Methane is a greenhouse gas and a major contributor to global warming.

Landfills are a stop-gap arrangement. All landfills have a limited life – they ultimately have to be closed and that land cannot be used for habiting people. So where will we dispose of the waste? Delhi is running out of landfill space and is now planning a landfill in Bhatti mines, a wildlife sanctuary in the Aravalli hills!

Garbage may not always decompose in landfills. High compaction rates starve the place of oxygen that is essential for decomposition. This results in anaerobic conditions which lead to a complex process of decomposition, much slower than aerobic decomposition. For example, newspapers in an aerobic worm decomposition pit can decompose in six weeks. In comparison, legible newspapers that were 10-30 years old have been found in landfills.

Have you ever seen a landfill? Maybe not. Landfills are always located away from places where people like us would normally reside. They are often sited in the poorest neighbourhoods without consulting the people there. Due to the miserable economic conditions, the government does not expect any protest or confrontation with them. The government will never construct a landfill near the city centre, though it may mean savings in transport costs. Imagine a landfill in Connaught Place in Delhi or at Nariman Point in Mumbai or at Kolkata's Maidan.

Incineration – Laying Waste Our Skies

Incineration seems a quick way of getting rid of our waste. For some it may seem a viable alternative to landfilling and other forms of waste management. After all, what better way to make waste disappear than into thin air? Well, that's not really true. The incineration of waste greatly compounds the problems of municipal waste.

Incineration, at best, is a mixed bag and a highly controversial method of getting rid of waste. The types of waste normally burnt by this process are municipal, medical and hazardous waste. However, since it is a combustion process, its by-products (ash and air emissions) are highly toxic and therefore dangerous to the environment and to human health.

Once an accepted technology in the West, incineration is being gradually phased out as a result of communities protesting its health hazards. Groups like GAIA (Global Alliance for Incineration Alternatives) are actively involved in such protests and campaigns. Also, innumerable health and epidemiological studies have forced regulatory agencies to make emission norms even more stringent. Incineration is an extremely expensive technology. For example, a single 2,000 metric tonnes/day capacity municipal incinerator in Amsterdam costs more than US\$500 million annually, that is, more than Rs 2,000 crore! Over 60 per cent of this money goes towards pollution control equipment.

The high temperatures that are required to ensure that



the waste is completely burnt, are rarely achieved due to design and operation faults. Moreover, waste normally consists of different materials that have varying melting points.

Public campaigns have led to the closure of several incinerators around the world. India too has put in place a complete ban on incineration of chlorinated plastics.

Environmental And Health Impacts

The process of incineration results in increased emissions of greenhouse gases, which contribute to the phenomenon of global warming.

Incineration destroys products that could have been recycled, such as plastic bags, paper and cartons. This implies that destroyed products have to be manufactured again from limited natural resources. Also, in a country like India, many people, such as *kabadiwalas*, waste dealers, recyclers, ragpickers, etc, depend on such waste. Burning away this waste destroys their source of livelihood without offering them alternatives.

Incineration, to be economically viable for its operator, needs an assured supply of waste. This again means waste that could be otherwise recycled is diverted for burning.

Incineration will not clean up our streets as waste collection depends upon on availability of waste collectors and receptacles. Thus incineration does not guarantee that all the waste will be removed.

Incineration produces highly toxic ash as a by-product. This ash is disposed of in landfills and contaminates the underground water and soil. Such contamination is impossible to clean up.

Municipal waste contains paper, plastic, batteries, metals, etc. When such waste is burnt in incinerators, toxic fumes containing heavy metals such as lead, cadmium, mercury and dioxins are emitted. Heavy metals and dioxins can cause irreversible damage to human health by affecting the kidneys and lungs, and even causing cancer. Dioxins enter the food chain and tend to bioaccumulate in our bodies. They affect the entire food chain right from tiny planktons at the bottom of the chain to humans who are at the top. The effect on humans is most severe due to the process of bioaccumulation, where the effect of toxins increases as one moves up the food chain.