



Frequently Asked Questions about Solid Waste

Chintan has compiled these questions and the answers to them, based on what we get asked most often.

What is solid waste?

Waste is what each one of us discards thinking that it has no more use. It can be a wrapping, leftover food, a worn out product (large or small) or a device that stopped functioning. We constantly discard things – from food wrappings to old cars: generating waste is an integral part of life, but it is particularly significant in consumerist societies where a growing numbers of goods with a short life are commercially accessible for a growing number of people. Our waste reflects who we are, what we do, what we eat - it reflects our beliefs, choices, tastes, our income, and most of all, our lifestyle and the lifestyle of those around us. Solid waste differs from liquid waste in that it cannot be removed automatically through underground sewage infrastructure, but requires a constant logistical effort.

Is waste bad?

Waste can become a problem when it comes in the way of our present and future wellbeing. This happens when there is too much of it accumulating in the same place, or when waste contains materials that are toxic and hazardous – that is materials that need to be handled with special care. Too many plastic bags thrown in the streets can choke a drain or be ingested by a cow; a single CFL bulb that breaks when it is discarded will release mercury vapors, a substance that is highly toxic for humans, affecting children and pregnant women in particular. Waste is a particularly bad problem in cities, due to lack of space, growing populations and the ubiquitous availability of disposable goods. However, solid waste can also be a very serious problem in places where regular waste removal is not available, like the trekking trails of the Himalayas or lakes.

Is all waste bad?

Most of the things we discard are made of materials that, if recovered and segregated, can be reprocessed, in full or in part, to produce new goods without extracting virgin material from the environment. This process is called recycling, and represents an important national economic sector, as well as an important way to preserve the environment for present and future generations and to save limited resources dedicated to solid waste management.

Some of the things we discard can also be simply reused – with the same use but at a lower quality ('reusing'), or with a new use ('up-cycling' or 'down-cycling', as in the case of old clothes transformed into carpets or plastic bags used to build tarmac roads). But do remember, you cannot recycle any material forever. So it's best to use less.

What is Solid Waste Management?

Solid Waste Management is a set of actions that aim to reduce drastically and in a planned way the chance of waste becoming a threat for people or the environment, in the present and in the future. These actions include removing, transporting, processing and disposing of solid waste away from waste generators, based on its type and composition. The most important categories of waste are wet (biodegradable) and dry (non-biodegradable) waste. Both wet and dry waste include recyclable and non-recyclable materials. Biodegradable waste is typically organic – food waste, leaves, paper etc.; non-biodegradable is material that will not decompose, or will take extremely long times to change physical and chemical structure if not processed – metal, glass, plastic, etc.

Who is responsible for Solid Waste Management?

Legally, urban local bodies are the main actor responsible for solid waste management in India. Citizens have however the largest power with regard to solid waste management: they are the ones who generate waste, individually, as families, and as businesses. The habits of citizens in disposing of waste can make the work of authorities very easy or very difficult – whatever the technology and approach employed.

Currently, India also has a very large number of people (estimated as 1-2% of the urban population) who work informally in the recovery of recyclable materials that are sent to the recycling industry. The role of the recycling industry, and particularly of informal sector workers – from waste pickers to small scrap dealers – has been proven to be critical in Indian cities' solid waste management, where they handle up to 20% of the waste generated, but still needs to be fully recognized or supported.

Manufacturers also have a legal responsibility to take on the disposal of the goods they sell, and accordingly to keep in mind disposal when designing a product. This implies not using materials that cannot be recycled, and offering options for consumers to dispose safely of products – including by returning to them - at the end of life of products.

The future of solid waste management depends in large part on the capacity these four (intersecting) groups – government, citizens, manufacturers and informal sector workers – will have to work together. This is what 'participatory solid waste management policy' means.

What kinds of waste exist?

Waste is categorized by type: different rules apply to the handling of different types of waste in India. At the level of municipalities, government regulations differentiate between: municipal solid waste, construction and demolition waste, e-waste (electronic and electrical waste), hazardous/industrial waste, biomedical waste, and plastic waste. Within the broad category of municipal solid waste, waste materials are often categorized as dry and wet waste, or biodegradable and non-biodegradable waste. Biodegradable or wet waste comprises of kitchen or food waste and is organic waste most of which can be easily composted. Dry waste includes all inorganic materials. Besides from this broad categorization, an important portion of the waste stream is sanitary waste. This includes used sanitary napkins, diapers, needles, condoms and bandaids. These are hazardous as they contain bodily fluid through which infectious diseases are easily transmitted – if not segregated from other waste, they pose a high risk to the health of waste handlers. Unfortunately, no specific rules currently apply to the management of such wastes in India unless produced within the premises of a medical institution.

How much waste does India produce?

We only have estimates of the amount of waste generated in India. According to the Government of India, India's 377 million urbanites produce 62 million tons of waste annually. The numbers vary. A 2010 McKinsey report estimates urban waste generation in 2007 at 71 million tons per year. The report estimates this to increase to 377 million tons by 2030 (1). A 2012 World Bank report estimates current annual MSW generation in India at 40 million tons and expects it to increase to 136 million tons in 2025 (2). Of this, over 50 percent is produced by cities with population greater than 1 million (3).

How much waste does Delhi produce?

Much like at the national level, data on waste generation at the city level is also based on estimates. In this case, estimates are based on the amount of waste that is received at the landfill, which excludes the waste that is never collected (up to 30%) and the significant proportion of the waste (from 20 to 60%) that is recycled by the informal sector and never reaches landfills. According to Delhi Department of Environment's website, the city produces approximately 8,000 tons of MSW per day (4). Many municipal officials informally estimate the amount as about 11,000 tons. The regional plan for the National Capital Region (NCR) estimates that NCT Delhi produces approximately 9,488 tons/day in 2001 and this is expected to increase to 15,413 tons/day by 2021 (5). A World Bank report estimates MSW generated in Delhi at 5,875 tons/day in 2005 (See footnote 4). A McKinsey report estimates that Delhi produces 3.2 million tons of waste per year in 2007 and this number is expected to rise to 14.1 million tons per year by 2025 (See footnote3). As you can see, the data is a problem.

(1) McKinsey Global Institute. 2010. India's Urban Awakening: Building Inclusive Cities, Sustaining Economic Growth. New Delhi: McKinsey Global Institute

(2) World Bank. 2012. What a Waste: A Global Review of Solid Waste Management. Washington, DC: World Bank

(3) Planning Commission. 2014. Report of the Task Force on Waste to Energy. New Delhi: Planning Commission

(4) <http://www.delhi.gov.in/wps/wcm/connect/environment/Environment/Home/Environmental+Issues/Waste+Management>

(5) http://ncrbp.nic.in/pdf_files/13bmodified_cho9swm.pdf

How much waste do I produce?

Per capita waste generation rates are typically calculated based on total waste generated divided by the population and are therefore only as accurate as the estimates of total waste generation rates and population sizes. Further, there is significant variation in the amount of waste generated based on household income. A World Bank study estimates per capita waste generation rates in Delhi at 0.57kg/day in 2005. The same report estimates current national waste generation rate in India at 0.34 kg/capita/day. This number is expected to double to 0.7 kg/capita/day by 2025 (See footnote 4).

How can waste tell whether a person is rich or poor?

Waste can tell a person's income in two ways—through quantity and composition. (6) Rich people typically consume more and therefore produce more garbage than poor people. A 2004 study examined waste generation rates in Delhi's households of differing socio-economic composition and found that per capita waste generation rate in low income household (maximum individual income less than Rs. 3000/month) was 0.14 kg/capita/day, in middle-income households (maximum individual income between Rs. 5,000-10,000/month) was 0.28 kg/capita/day, and in high income households (maximum individual income more than Rs. 15,000/month) was 0.31 kg/capita/day. Rich people also consume differently and therefore produce garbage of different composition than poor people. A 2007 study commissioned by the (then) Municipal Corporation of Delhi examined waste composition in 4 different socio-economically delineated neighbourhoods in Delhi found that the proportion of recyclable materials and calorific value of waste increases with income (ibid).

Who is responsible for waste in Delhi?

All those who consume commodities and therefore produce waste are responsible in some way for waste in Delhi. The Delhi Municipal Corporation Act and Municipal Solid Waste (Management and Handling) Rules 2016 hold municipalities accountable for ensuring that the waste generated in the city is managed properly. Check out your municipality and you will know who is responsible!

For certain types of waste, such as e-waste and plastic waste, government rules have adopted the principle of extended producer responsibility which holds manufacturers of those commodities responsible for their proper disposal. Under this principle, manufacturers of electronic/electrical commodities and plastics are required to establish collection centers for plastics and e-wastes. Citizens are also responsible. Please see Chintan's website for more details on the rules.

(6) COWI and Kadam Environmental Consultants. 2004. Feasibility Study and Master Plan for Optimal Waste Treatment and Disposal for the Entire State of Delhi based on Public Private Partnership Solutions. Delhi: Municipal Corporation of Delhi

Are single use plastics illegal?

Single use plastics are illegal only in some forms, and in some states, such as Tamil Nadu, Maharashtra and Telangana. These states have listed and banned several single use plastics. However, as responsible citizens, it makes sense to find ways to avoid using single use plastics. See Chintan's handbooks to help you to do this.

Why are plastics considered bad?

It is true that plastics are not good for the environment, even though they are also useful. However, their impact of the environment outweighs the benefits from them. This is why even the United Nations Environment Programme has pushed against them globally. Some reasons why they are not good are : they block our drains, they fly away and get stuck on our trees where animals eat them and suffer from ulcers, stomach blockage and other health problems. Plastics break down into micro-plastics and end up in our waterways. Eventually, they not only block the insides of aquatic animals but also impact their very functioning at a cellular level. This apart, plastics often have additives that leach, and eventually, enter into our own bodies, poisoning us slowly. While some plastics can be recycled, there is a limit to how much recycling is possible. Typically, plastics can be recycled 3 times, after which they must be thrown away and contaminate the planet.

What is the ideal waste scenario from the perspective of an individual, a household, a colony, an office, a ward and a city?

The efficiency of resource recovery from waste decreases as waste moves from the point of generation to the point of disposal because of the potential of contamination of recoverable materials along the way. For example, paper that gets wet or dirty with other waste, cannot be recycled. For this reason, the more localized waste management is, the better resource recovery results it is likely to yield. From the perspective of an individual/household/office, the ideal waste scenario is that segregation-at-source takes place in at least three different categories: organic or biodegradable or wet waste; recyclable dry waste; and non-recyclable and harmful waste such as sanitary waste and sharp objects. These should be collected and managed separately by waste collectors and the city's waste management systems. If individuals/households/offices are able to compost at source, they can reduce their waste footprint on the city's systems considerably by processing their organic waste which accounts for anywhere between 50 and 70 percent of total waste generated. From the perspective of a colony, the ideal waste system should involve ensuring that all households practice source segregation and set up decentralized composting systems with the help of informal sector workers. If possible, colonies could also set aside a small area to allow waste collectors to temporarily store recyclable materials. From the perspective of a ward, space needs to be allocated for decentralized waste management activities including composting space in local parks and localized material recovery facilities that allow for optimal resource recovery. RWAs have a large role to play in this regard. From the perspective of the city, the ideal should be to enable as much resource recovery as possible so that what needs to be disposed is only non-recoverable and harmful material. Cities can do this by providing financial and technical guidance to encourage local waste management systems and ensuring that space for decentralized and centralized waste management systems is allocated in city master plans. The informal sector plays a crucial role in providing waste management services in cities, therefore cities must include, recognize and formalize them to be a part of their urban service provision systems, as a recognized profession.

Why should we think of wastepickers as useful to our city?

Wastepickers provide crucial waste management services to our city by collecting, sorting and recycling waste materials and thereby reducing the waste burden on cities. Without their work, our city would be buried under piles of garbage. According to some estimates, waste pickers recycle anywhere between 20 and 60 percent of the waste we produce. Furthermore, they are not often paid for the services they provide, so in essence by doing a part of the work of municipalities, they subsidize the urban services that we all benefit from.

Wastepickers dirty the entire pavement when they sort out the waste-why isn't that being stopped? How can it be stopped?

We could give them our dry waste proactively at the shop or doorstep. They could be trained to sort out waste without making a mess. To do so, space can be allocated to them for sorting waste. Further, timely collection and removal of garbage from collection points such as dhalaos can ensure that bins don't overflow.

Wastepickers are poor, but how poor?

No doubt wastepickers are amongst the poorest of the urban poor. But by extracting and recycling waste materials, they often make enough money to make a living though at the expense of their own health. Poverty is not only about earnings, but about access to the things that make the quality of life better. Since they are unable to access healthcare, social security, decent housing and even bank accounts, they remain deprived and therefore, poor. If there was less stigma against them, they may have fared better.

Why don't we recycle our waste in India?

Contrary to popular belief, India has a vibrant and efficient recycling system that is enabled by the work of wastepickers. Most of us segregate and store high-value recyclable materials to sell to kabariwalas or itinerant buyers. Aside from this system, wastepickers go through our garbage to sort out recyclable materials. This recyclable materials is sold to waste dealers who then provide this as raw materials to reprocessing units. Aside from recycling, we also have systems of reuse and exchange such as exchange of old clothes for kitchen utensils. Compared to the West and developed countries where recycling systems need to be heavily government subsidized, our systems are self-sustaining, even though waste professional still pay a high price in terms of health and wellbeing for lack of recognition, training and gear.

Does waste cause pollution? If so, how?

Waste causes pollution in a number of ways. Open burning of waste, especially particular kinds of plastics, releases toxic fumes that contain harmful chemicals such as dioxins and furans that pollute the air and can cause various health problems including reproductive, developmental, hormonal and cancers in humans (7). Further, toxic metals including heavy metals (Arsenic, Beryllium, Cadmium, Lead etc.) from different kinds of waste pose significant health hazards (8). Litter is not only unsightly but can choke urban drainage systems that can then cause floods. This disproportionately affects the poor because they often live in areas that have more open drains. Throwing garbage directly into waterways pollutes the water. Aquatic life can choke on various kinds of waste materials particularly plastics. Microplastics further damage marine life, often irreversibly. Toxics and heavy metals can leach out from waste materials into the waterways poisoning human and non-human organisms that access those waterways. In landfills and open dumps, rotting garbage produces methane which is a greenhouse gas. Spontaneous fires from methane at dumps also pollute the air. Leachate is a liquid that seeps out of rotting garbage and is highly toxic and is known to be carcinogenic. This seeps into our groundwater supplies posing significant health hazards. A 2014 study by Jawaharlal Nehru University's Department of Environment on the groundsoil of Delhi's three landfills showed that the level of organic pollutants on these sites exceeded permissible levels by 158 times (9).

Does waste damage our health? How?

Waste damages our health in many ways. First, it most immediately damages the health of those who handle the waste because they often get injuries and various kinds of illnesses from different waste materials. Second, unmanaged garbage allows various kinds of disease vectors to flourish such as flies, mosquitoes and rats. A single household garbage bin can produce up to 30,000 flies per week. The potential of disease vectors from community bins and open dumps is immense. Third, air, water and groundwater pollution from waste affects all of us. Infact, waste mis-management is a significant contributor to air pollution in India.

What kinds of wastes are the worst?

From the perspective of waste handlers, wastes that are injurious and harmful such as sharp objects and sanitary waste are the worst. From the perspective of cities, toxic waste and non-recyclable waste (waste that cannot be reprocessed into useful materials) is the worst.

(7) <http://www.who.int/mediacentre/factsheets/fs225/en/>

(8) <https://www.osha.gov/SLTC/metalsheavy/>

(9) <http://www.dailymail.co.uk/indiahome/indianews/article-2864658/Delhi-risk-landfill-sites-leak-cancer-causing-chemicals-water-supply.html>

(10) <http://ipm.ncsu.edu/srurban/CHAP6/flies.htm>

I feel that we have to first and foremost stop littering. If we do that, India will become a clean country. Am I right?

Stopping littering is a great idea but unfortunately is not the panacea for India's waste management woes. Following the three Rs—Reduce, Reuse, and Recycle—will help make India much cleaner. Stopping litter largely only resolves an aesthetic problem. The garbage produced, even if it's not littered around our streets, still needs to be managed. Unfortunately, our existing landfills have reached capacity and space for new landfills is increasingly hard to find. Following the three Rs will do a long way in helping alleviate the waste burden on our cities.

We can't move ahead without segregation of waste. Am I right? Is this the biggest problem with India and our waste?

We can move ahead with source segregation but it will be a short path followed by a steep downhill slope. In the long term, segregation will be key to making our country cleaner. Most people blame their domestic help as reasons for lack of source segregation. Others blame waste collectors. The problem is partly behavioral but mostly infrastructural. There is no sense in segregating waste at source if separate systems for collection, transportation, and waste processing do not exist. You can do your part by separating waste but the city also needs to do its part by ensuring that those systems and infrastructures are put in place. In the meantime, you should anyway start composting your segregated wet waste home to prevent it from polluting the city.

What is a citizen's role in waste in any city?

Citizens should abide by the principle of the three Rs—Reduce, Reuse, and Recycle. Reducing consumption should be the very first step. Reusing old things rather than buying new things should be next in line. Although citizens typically cannot recycle materials themselves, they can help improve the quality of recyclable waste and enable safer work conditions for waste handlers by practicing segregation-at-source.

What is the first step I need to take to handle waste?

The easy first step one can take in handling waste is segregating it into at least three categories: organic or biodegradable or kitchen waste; recyclable dry waste; and harmful or injurious waste such as sharp objects and sanitary waste. Even if you don't have a segregated disposal system, you can compost the wet waste at home and give off the dry waste to a wastepicker. The hard first step is to measure how much waste you generate and reduce it. Buy less, repair more and refuse waste, including products and services from companies that give you surplus packaging.

Paper is not recycled in India. What should I do? Shall I start recycling it?

Paper is recycled in India by the informal sector, which feeds it into the formal sector paper mills. The only paper that isn't recycled is what gets contaminated and wet by mixing with other waste. What you can do to make this system even more efficient is to keep dry waste like paper separate from wet waste and give it to your kabariwala or doorstep waste collector. The paper industry in India currently imports large quantities of paper from abroad, for lack of waste paper in the domestic recycling market. So, it is not correct to say that paper is not recycled in India.

I want to do something to handle the waste in my office-shall I set up a paper recycling unit?

See responses above.

Plastics are terrible, I know. But I can't stop using every single plastic. What should I do?

You can do a few things.

- (a) You can reduce your plastics consumption by substituting it with other materials such as cloth bags.
 - (b) You can reuse your plastic bags rather than getting new ones every time you go to the market.
 - (c) You can advocate for plastics manufacturers to substitute plastics packaging with other less harmful materials.
 - (d) In 2016, India passed the Plastic Waste Management and Handling Rules that specifically apply to the management of particular kinds of plastic waste. These rules hold producers of plastic packaging accountable for their disposal using the concept of Extended Producer Responsibility which asks that the plastic manufacturers set up collection centers for currently non-recyclable plastic wastes. Unfortunately, these rules have yet to be implemented. You can help by writing to your local politicians to demand that the plastics industry be held accountable for the waste it produces.
 - (e) And finally, cut out all Single Use Plastics from your life. Check out Chintan's website for an appropriate manual.
-

I want to be part of Making My City Swachh. What shall I do?

You can be a part of making your city Swachh by doing some very simple things. First, you need to segregate your waste at source (into wet, dry and hazardous) so that you enable safer working conditions for waste handlers and improve recycling rates. Second, you could start composting at home to reduce the waste burden on the city. Third, you could talk to your RWA to make sure source segregation is enforced in your colony and perhaps even set up a local neighborhood composting system. Fourth, you should talk to your waste collector to understand how you can help them do their work better. Fifth, you should make sure that kabariwalas are allowed into your colony so that our existing system of recycling works well. Sixth, you could make sure you give potentially toxic waste such as e-waste only to authorized collectors.
