

# Why Waste Trash

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## A taste of trash

It is likely that at some point in your life, you may have sipped on trash.

Don't be surprised. Read on to understand how this ghastly moment might have come to pass.

In a nutshell, the horror story is this. The Ministry of Environment, Forests and Climate Change recently estimated India's annual waste generation at 62 million metric tons<sup>1</sup>. In India, a significant amount of this trash is dumped along the outskirts of the city, in large, informal dumps. These dumps are not landfills, are not scientifically engineered and are not layered with leachate run off prevention.

Hence, almost every landfill-with only some recent exceptions-are simply dumps. When a city sends its waste to its local dump, the waste mixes with dew, rain and other condensation, to create leachate-a liquid that slowly hits the ground water. This noxious liquid is what we drink, when we draw out waste from hand pumps, or even, bore wells.



## What's the problem?

Currently India is the highest user of groundwater in the world, estimated at 230 cubic kilometers per annum, more than a 1/4<sup>th</sup> of the global total. That's the water that could have been used for tea in a location you could have gone for on a holiday, or in the town where you first worked. Or even, in a big city, where so many dumps exist over time, leaching away into the water source. The International Association of Hydrological Sciences has reported cases of groundwater pollution due to landfills and toxic leachate from landfills, as among the highest groundwater quality risks globally. This goes to show the urgent need for a shift in manner of disposal of solid waste in our country, in order to preserve water resources.

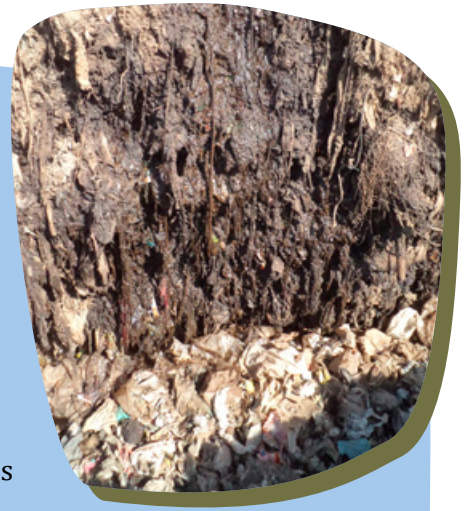
The sheer horror apart, toxicity is also a reality. Chintan looked at studies examining the composition of landfill leachate from across India to see if a broad picture emerged. We analyzed studies from Tamil Nadu (Pallavaram landfill in Chennai and Erode), Maharashtra (Pune and Sholapur), Delhi (Ghazipur landfill), and Kerala (Trissur).

1 Mallapur, C. (2014, December 12). India Spend. Retrieved April 1, 2016, from India Spend Website: <http://www.indiaspend.com/cover-story/3-million-truckloads-daily-indias-real-trash-problem-68539>

2 Ibid.

Each of these, without fail, showed that significant amounts of toxics were being dumped into the ground water, as well as soil, from the landfills and dumps.

Take this recent study done at the municipal waste disposal site at Thrissur in Kerala<sup>3</sup>. A group of researchers collected soil and leachate samples from the dumpsite and tested them for various parameters. They found that the physico-chemical parameters of the leachate exceeded the specified standards for disposal into surface water bodies or sources. They also tested soil characteristics and found its properties had changed due to leachate. “Solid waste dumps have some effect on the engineering and chemical properties of soil. Not only does it reduce the overall soil strength and consequently its usefulness as a foundation material, it also can result in pollution of ground water sources due to percolation of toxic and hazardous chemical,” concluded researchers from IIT Madras and National Institute of Technology Karnataka.<sup>4</sup>



A study conducted by Jawaharlal Nehru University’s Department of Environment conducted between 2012 and 2013 revealed that the ground soil of the area harbor organic pollutants exceeding the permissible limits by up to 158 times. The study showed the site to be high in compounds such as aliphatics, terpenoids, benzenes, ketones, pharmaceuticals and phthalates which do not degrade and enter the food chain leading to hormone disruption, reproductive disorders, learning disabilities, heart diseases, diabetes and cancer. The Ghazipur site also contains compounds that are cytotoxic, i.e. human cell killing, in nature.

The following table demonstrates the toxicity of the soil at the Pallavaram landfill in Chennai, 2008.

**Table 1: Solid waste and soil quality parameters in Joy Nagar near Pallavaram landfill (mg/kg)<sup>5</sup>**

	Soil sample (mg/kg)	Soil sample (mg/kg)	Solid waste sample (mg/kg)	Solid waste sample (mg/kg)	Desirable limit (mg/kg) IS 10500: 1991 (as defined in the MSW Rules, 2000)
Lead	51.52	19.3	87.81	75.08	0.05
Cadmium	0.40	0.27	2.10	1.80	0.01
Copper	43.08	36.55	267.9	137.9	0.05
Manganese	110.8	65.89	291.6	208.3	0.1
Chromium	44.28	8.41	38.5	33.8	0.05
Nickel	9.52	6.25	19.3	16.4	–
Mercury	0.20	0.11	0.37	0.16	0.001

**Source:** N Raman, D. S. (2008). Impact of Solid Waste Effect on Groundwater and Soil Quality Nearer to Pallavaram Solid Waste Landfill Site in Chennai

There is no doubt that the leachates are toxic. But how to these harm us?

- 3, 4 Sruti Pillai, A. E. (2014). Soil Pollution near a Municipal Solid Waste Disposal Site in India. International Conference on Biological, Civil and Environmental Engineering. Dubai: International Institute of Chemical, Biological and Environmental Engineering
- 5 N Raman, D. S. (2008). Impact of Solid Waste Effect on Groundwater and Soil Quality Nearer to Pallavaram Solid Waste Landfill Site in Chennai. Rasayan Journal of Chemistry, 826-836.

**Table 2: Common metallic and other contaminants found in groundwater and their impact on human health**

Contaminant	Impact
Cadmium	Kidney poisoning, genetic mutations, renal lesions. Group I carcinogen
Chromium	Lung tumors
Copper	Metabolic disorders
Lead	Abdominal and nervous system damage
Sodium	Heart damage
Antimony	Altered blood levels of glucose and cholesterol and reduced longevity
Arsenic	Acute and chronic toxicity, liver and kidney damage. Decreases hemoglobin and is a carcinogen
Barium	Cardiac, gastrointestinal and neuromuscular effects
Beryllium	Toxicity, damages lungs and bones.
Cyanide	Poisons spleen, brain and liver
Fluoride	Causes bone disorders and calcification of joints
Mercury	Toxicity. Damage to kidneys and nervous system disorders
Nitrate	Causes 'blue baby' disease

**Source:** United States Geological Survey: Contaminants Found in Groundwater

## How shall we make it go away?

Groundwater contamination poses a big risk to human health and can cause life threatening diseases. The Swacch Bharat Abhiyaan along with the newly promulgated Solid Waste Management Rules, 2016, can be a game changer with regard to the manner in which waste will be handled, disposed and treated. Any waste that is brought even to the best landfill in the world poses a risk because even the best landfills have an 'engineered life,' after which they begin leaking. Burning the waste via waste-to-energy plants is not the alternative either, because of air pollution and the subsequent ash which is hazardous.

Globally sensible solutions are veering towards two things: not allowing anything compostable or recyclable or toxic into landfills. And second, handling many fractions locally. In San Francisco, for example, you simply have to have to compost wet waste, often close to where it is generated. In India, we can follow the same dictum by composting locally, letting wastepickers take away the paper, cardboard plastics and metal, and involving manufacturers in our EPR-Extended Producer Responsibility. We must ensure that those manufacturing or importing batteries, dry cells, pesticides etc. are able to take them back and save our waste from becoming the toxic disaster it currently is. There is no other way out of this.