Toxic Wastes

Growing Hazard

Ravi Agarwal

The toxic and hazardous waste load in the country is rising with petrochemical, pharmaceutical, pesticide, paint, dyes, fertiliser, and ship-breaking industries topping the list. It is a scary scenario with the waste being dumped into rivers, spread on land, and injected into deep wells.

India's burden of toxic and hazardous waste is rising. Such wastes are generated both in industrial as well as urban sites; however, information both on the generation and the disposal of hazardous waste is limited. Scantier still is data on its impact on people's health and the environment.

Industry is the most significant generator of toxic wastes with petrochemical, pharmaceutical, pesticide, paint, dyes, fertiliser, and ship-breaking industries topping the list of waste generators (Chakrabarti *et al*. 2007). About 3 million small- and medium-scale industries engaged in leather tanning, textile dyeing and printing, chemical formulations, electroplating, and so on, produce over half the hazardous waste (Ministry of Micro, Small and Medium Enterprises 2002). A one-time estimate indicates that about 7.2 million tonnes per annum (mta) of industrial hazardous waste is generated (CAG [Comptroller and Auditor General of India] 2007).The more industrialised states produce higher quantities of hazardous wastes, as evident from Figure 4.1.

Infrastructure to safely dispose hazardous wastes is slowly growing, but still very rudimentary. Prompted by the Supreme Court, the government has been setting up infrastructure for the collection and disposal of hazardous waste through integrated Treatment, Storage, Disposal Facilities (TSDFs). By 2012, 22 such facilities had been installed in 10 states, for a total waste handling capacity of about 1.5 million tonnes per year. This capacity still leaves a gap of about 1.23 mta waste, which has been already inventoried (CPCB 2009b). (Since 1995, national standards for landfills and incinerators have also been established. Besides, over 770 units with a combined capacity of over 3 mta have been registered to recycle wastes like used oil, metal bearing wastes, e-waste, and paint sludge [ibid.])

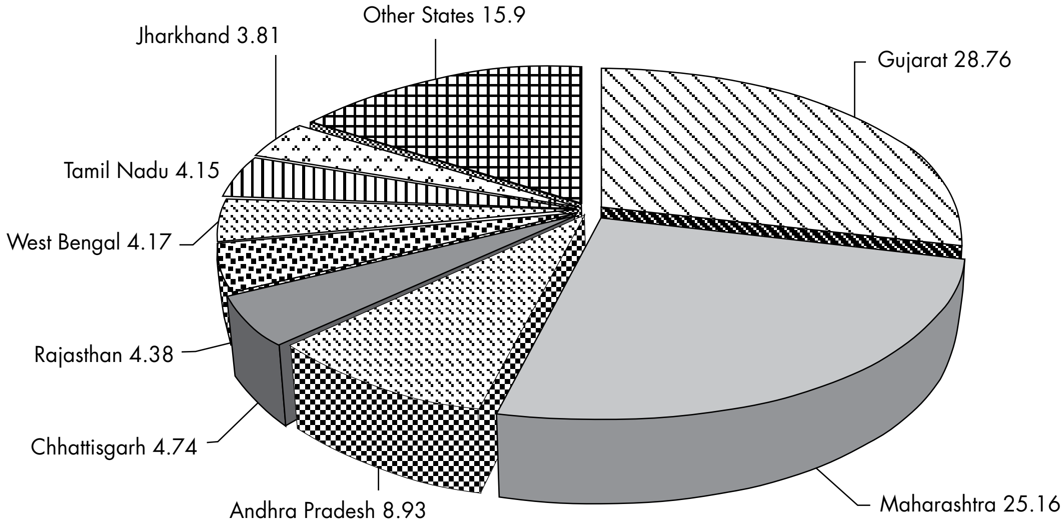


Figure 4.1: Major State-wise Generation of Hazardous Wastes in India (Share in Percentage)

Source: Central Pollution Control Board (2009b), 'National Inventory of Hazardous Wastes Generating Industries and Hazardous Waste Management in India', Delhi: Central Pollution Control Board, Hazardous Waste Management Division. Available at http://cpcb.nic.in/wast/hazardouswast/InventoryofHW.pdf (accessed on 20 November).

A worker in Bangalore recovers metal parts from waste with no protection. Often hazardous industrial waste ends up in informal recycling units.
Courtesy: *Max Martin*

Similarly, Common Effluent Treatment Plants (CETPs) have been set up in industrial clusters, mainly for small-scale industry. However, these are plagued by problems such as inadequate power, lack of downstream landfills, remixing of treated with untreated effluents, and so on (Toxics Link 2000).

For biomedical waste collection and treatment, 160 Common Waste Treatment Facilities (CWTFs) are operating across the country, all through private sector participation(CPCB 2009b, 2009c). There are 188 common waste treatment facilities and 17 under construction.[1] Also, some initiatives in Bangalore have attempted to create 'green' collection channels, to allow e-waste to flow to more organised recyclers. For other household hazardous wastes, there are no provisions for collection so far.

Several industrial hotspots exist with severe chemical contamination, especially in the more industrialised states (CPCB 2009a). The CPCB has identified 88 polluted industrial clusters, in order of contamination, based on a Comprehensive Environmental Pollution Index (CEPI). Out of these, 43 are 'critically' polluted. Many of these industrial clusters have a mix of small- and medium-scale enterprises and manufacture pharmaceuticals, drugs, dye and dye intermediaries, pesticides, chlor-alkali, sponge iron, etc. (CPCB 2009a).

Wastewater generation from industry has been estimated to be 13,500 million cubic metre per day (mcd), of which 5,500 mcd is dumped directly and untreated into local rivers and streams (CPCB 2009c). It is often contaminated with highly toxic organic and inorganic substances, some of which are persistent pollutants. This is one of the reasons why all of India's 14 major river systems are heavily polluted.

In addition to industry, electronic waste generation has increased significantly in recent times and is pegged at over 400,000 million tonnes per annum (mta) (MAIT 2009) and rising at over 3 per cent per annum. Further, cities generate significant amounts of hazardous biomedical waste, electric and electronic waste (e-waste), discarded lead acid batteries, and waste oils. Large cities like Delhi have been estimated to be producing over 21,000 million tonnes (mt) of biomedical waste, 5,000 mt of industrial waste, and over 12,000 mt of e-waste per annum (Toxics Link 2003).

Other hazardous waste streams include household medical waste, mercury and nickel-cadmium (ni-cd) batteries, mercury-based thermometers, and fluorescent lamps—particularly because of the recent shift to compact fluorescent lamps (CFLs) as energy savers. Currently, there are no separate collection and recycling or disposal systems for this portion of the waste stream, though mercury and e-waste collections have been proposed in some states like Delhi. Also, small- and tiny-scale industrial enterprises in urban areas often discard hazardous wastes into municipal waste or directly into sewers. Waste oil is discarded in motor garages and machine shops. Further, radioactive waste illegally discarded as scrap from hospitals, laboratories, and industries is an increasing source of concern.

Importing Hazards

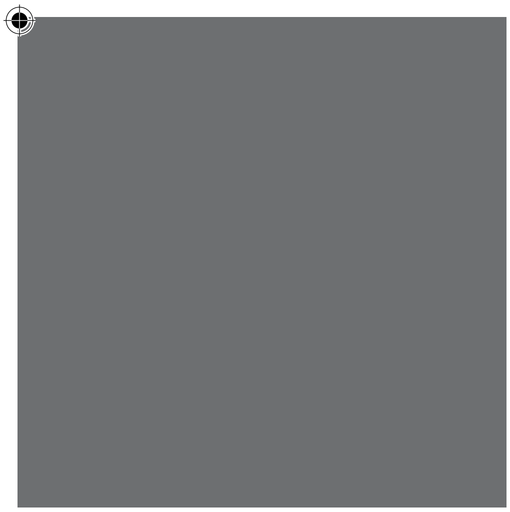
In addition to the hazardous waste generated within the country, many types of waste, often mixed with metal scrap, are also imported in large quantities into India. These are usually illegally misclassified in the import documents. Imported wastes include clinical waste, industrial ash, battery scrap, asbestos waste, etc.[2] In addition, it is estimated that over 50,000 mt of e-waste finds its way into India annually (Toxics Link 2008). Several ships also come to be broken at Alang in Gujarat, which is the world's largest ship-breaking yard. These old ships contain hazardous substances like asbestos, Polychlorinated Biphenyl (PCB) oils, and toxic paints containing lead and tributyltin (TBTs) (Bailey 2000) making their safe disposal here a near impossibility.

This indiscriminate import of toxic waste has been noted by a committee on management of hazardous wastes set up by the Supreme Court, which pointed out that large amounts of waste oil, asbestos waste, lead waste, etc., have been allowed into the country. The committee also emphasised the need for 'a proper policy on hazardous wastes that would minimise, if not eliminate, the need for imports of such material' (High Powered Committee on the Management of Hazardous Wastes 2001).

Instead of formulating protective policies, the government has been encouraging waste imports openly as a source of cheap raw material, even though it contains hazardous elements which are dumped locally (Toxics Link 2009a). Of late, developed countries are taking steps to enable easier dumping of their hazardous waste in India. Under the new Free Trade Agreements (FTAs) being negotiated with Japan and the European Union, for example, waste is being referred to as 'non-new goods',[3] evidently to sidestep existing legally bound definitions and to permit trade in it (*Daily News & Analysis* 2010).

Waste Disposal

Commenting on the impact of such toxic waste on health and environment, the National Chemicals Management Profile (NCMP) report points out that 'there is a general lack of health-related data, either in relation to public health or the workplace'(NCMP 2006: 224). Consumer and worker health-related data is also poor (NCMP 2006). This is complicated by the fact that over 70 per cent of the workforce affected by such pollution is agricultural labour, while the rest is a constantly mobile, migrant labour working in urban sites. Less than 10 per cent of the labour force works in the organised sectors. Given the unorganised and migratory nature of the workers affected, documentation of either immediate or chronic impacts from waste-related exposures does not exist.



Infrastructure to safely dispose hazardous wastes is slowly growing, but still very rudimentary. Prompted by the Supreme Court, the government is now setting up infrastructure for the collection and disposal of hazardous waste through integrated Treatment, Storage, Disposal Facilities (TSDFs). Till date, 26 such facilities have been installed in 12 states and nine TSDFs are under construction in seven other states, for a total waste-handling capacity of about 1.5 mta. This capacity still leaves a gap of about 1.2 mta waste, which has been already inventoried (CPCB 2009a). Since 1995, national standards for landfills and incinerators have also been established. Besides, over 770 units with a combined capacity of over 3 mta have been registered to recycle wastes like used oil, metal-bearing wastes, e-waste, and paint sludge (ibid.).

However, these waste disposal efforts have glaring gaps. Given that cleaning chemical waste is an expensive and complex issue, the contaminated sites identified by CEPI still do not have special remediation or preventive provisions to deal with such waste. Twenty-five years after the chemical disaster at Bhopal, the site has still not been cleaned up.

Most of the urban recycling of waste is carried out in the informal sector, by migrant workers, many of whom are women and children. They recover lucrative materials such as gold, aluminium, palladium, copper, plastics, and glass; but work under highly hazardous conditions using rudimentary techniques and tools. Electronic waste is a case in point. Over 95 per cent of the recycling of such waste is carried out in the informal sector, exposing workers to acid fumes, toxics compounds like dioxins, heavy metals, brominated flame retardants, and occupational hazards (Toxics Link 2003).

Policy and Legislation Regulation

All hazardous waste, except radioactive waste, comes under the purview of the Ministry of Environment and Forests (MoEF), and various rules have been notified under the umbrella Environment Protection Act (EPA), 1986. Some key laws include the Hazardous Waste Management and Handling Rules 1986 (last amended April 2010), the Bio-Medical Waste Management and Handling Rules (1998), and the Battery Management and Handling Rules (2000). A set of new e-waste Management and Handling Rules (Draft 2010) has been recently issued. In addition, ship-breaking is governed by recommendatory guidelines issued by the CPCB (CPCB 1998). The Ministry of Health and Family Welfare (MOHFW) has initiated a programme to ensure safe disposal of infectious syringes and plastic waste from immunisation activities (MOHFW 2007).

India is also a signatory to various international, legally binding treaties such as the Basel Convention for the Trans-boundary Movement of Hazardous Wastes (1989), the Stockholm Convention on Persistent Organic Pollutants (2002), and the Rotterdam Convention on Prior Informed Consent (2004), all under the auspices of the United Nations Environment Programme (UNEP). India's stance has, however, shifted over time, going from strongly opposing the import of all hazardous waste into the country in 1989 (it supported the Basel Ban Amendment, which prohibits hazardous waste imports both for disposal and recycling) to encouraging its import as a means of acquiring cheap raw materials today.

Overall compliance to the law with regards to waste generation and disposal is weak and wanting. According to a report by the CAG (2007), the biomedical waste law, which is the best implemented so far, has only about 50 per cent compliance. Poor capacity in the State Pollution Control Boards, lack of adequate monitoring, and a lack of transparency and accountability have led to this dismal situation (MoEF 2009a). In 2009/10, discussions to set up an independent National Environmental Protection Authority (MoEF 2009b) are being carried out. However they seem to have been shelved now.

The disposal of radioactive waste needs special mention. This is dealt with solely under the Atomic Energy Act, 1956. All facilities, including nuclear reactors that use and dispose radioactive materials, require authorisation from the Atomic Energy Regulatory Board (AERB). However, cases of illegal imports and disposal have come to light. In April 2010, Cobalt 60, which was illegally sold off from the University of Delhi's laboratory, severely exposed seven people to acute radiation in the Mayapuri scrap yard in Delhi (*Hindustan Times* 2010). Earlier, some export consignments of contaminated steel products were returned from France (Toxics Link 2009b). Given this, there is an urgent need for better on-the-round monitoring of nuclear materials, more information, transparency, and public awareness as well as the need for infrastructure like the installation of nuclear detectors at ports. This need is even more acute in the face of plans to increase civilian nuclear energy and the increased use of radioactive materials in healthcare and industry.

Civil Action

Several stakeholders such civil society, the judiciary, and the media have played a pivotal role in bringing the issue of toxic wastes to the fore, raising public awareness, and helping find and implement solutions. Labour unions have also played an important part in sensitising workers. However, there are no formal avenues for their participation with the state, even though consultations with industry associations are a regular feature. Institutional actors like the German GTZ, World Bank, and World Health Organization (WHO) have also contributed through specific projects and initiatives providing for safe disposal of biomedical waste.

Conclusion

Overall, the situation with regard to toxic wastes is far from satisfactory in the country, as waste continues to be dumped in rivers, on land, and even illegally injected into deep wells. Catastrophic events like the tsunami in 2004 also threaten coastal dumping sites. Efforts must be made to ensure that waste generated by industrial growth and urbanisation is reduced. This needs preventive approaches. Pollution prevention, cleaner production, increased recycling, and substitution of toxics in products are the ways forward. These have to be supported by improved regulation and adequate investments in infrastructure for treatment and disposal. The keys to effective waste management are stakeholder participation, better governance, and informational transparency. This may be the only sustainable way ahead to protect human health and the environment from hazardous wastes.

End Notes

1. Data available at http://cpcb.nic.in/wast/bioimedicalwast/AnnualReport2010_final.pdf.(accessed on
2. Ashish Kothari, personal communication, 2010. Information obtained by Right to Information (RTI) on import of hazardous waste into India.
3. Article X-15 of the draft India-EU FTA talks about 'non-new goods' and says that neither party shall apply to non-new goods, measures, including enforcement measures, which are more restrictive than to new goods. The treaty which was expected to be finalized in December 2010, has still not been signed.

References

Bailey, Paul J. (2000), 'Is There a Decent Way to Beak Up Ships?' Discussion Paper, Geneva: International Labour Organization. Available at http://www.newgreenblue.org.uk/pdf/z%201130.%20Is%20there%20a%20decent%20way%20to%20break%20up%20ships.pdf (accessed on 20 November 2012).

Chakrabarti, T., M.P. Patil, and Sukumar Devotta (2007), *Status Report on Management of Hazardous Waste in India*, Nagpur: National Environmental Engineering Research Institute.

CPCB (Central Pollution Control Board) (1998), *Environmental Guidelines for Ship-Breaking Industry*. Available at http://cpcbenvis.nic.in/newsletter/hwastemanagjun1998/jun98vi.htm (accessed on 20 November 2012).

——— (2009a), 'Comprehensive Environmental Assessment of Industrial Clusters'. Available at http://www.cpcb.nic.in/divisionsofheadoffice/hwmd/Information_TSDF.pdf (accessed on 20 November 2012)

——— (2009b), National Inventory of Hazardous Wastes Generating Industries and Hazardous Waste Management in India, February 2009. Delhi: Central Pollution Control Board: Hazardous Waste Management Division. From CPCB data available at http://cpcb.nic.in/wast/hazardouswast/InventoryofHW.pdf (accessed on 20 November 2012).

——— (2009c), *Wastewater Generation and Treatment*. Available at http://www.cpcb.nic.in/oldwebsite/News%20Letters/Latest/ch2-0205.html.

CAG (Comptroller and Auditor General of India) (2007), Performance Audit of Management of Waste in India (PG), 2007. Available at http://www.cag.gov.in/Activity/2006-07/Perf-Rep06-07.pdf (accessed on 20 November 2012).

Daily News & Analysis (*DNA*) (2010), 'Free Trade Agreements May Aid Toxic-Waste Trade', 12 January. Available at http://www.dnaindia.com/money/report_free-trade-agreements-may-aid-toxic-waste-trade_1333702 (accessed on 3 October 2012).

Hindustan Times (2010), 'No Checks on Delhi's N-Waste', 10 April. Available at http://www.hindustantimes.com/newdelhi/No-checks-on-Delhi-s-N-waste/536847/H1-Article1-529404.aspx (accessed on 3 October 2012).

HPCMHW (High Powered Committee on the Management of Hazardous Wastes) (2001), *Report of the High Powered Committee on the Management of Hazardous Wastes by M.G.K Menon* (chairperson), Supreme Court of India. Writ Petition No 657/95, Resource Foundation for Science, Technology and Natural Resource Policy V/S Union of India and Ors, pp. 166–72, 180.

MAIT (Manufacturers Association for Information Technology) (2009), 'E-Waste Generation in India', GTZ-MAIT Study. Available at http://www.weeerecycle.in/publications/reports/GTZ_MAIT_E-waste_Assessment_Report.pdf (accessed on 20 November 2012).

MoEF (Ministry of Environment and Forests) (2009a), *State of India's Environment Report*. Available at http://envfor.nic.in/downloads/home/home-SoE-Report-2009.pdf.(accessed on 20 November 2012).

——— (2009b), 'Proposal for a National Environmental Protection Authority', Discussion Paper. Available at http://moef.nic.in/downloads/home/NEPA-Discussion-Paper.pdf (accessed on 20 November 2012).

Ministry of Housing and Urban Poverty Alleviation (2009), *India Urban Poverty Report*: 2009, UNDP Ministry of Housing and Urban Poverty Alleviation, Government of India, Oxford.

MOHFW (Ministry of Health and Family Welfare) (2007), *Infection Management and Environmental Plan, Policy Framework*, National Rural Health Mission. Available at http://www.mohfw.nic.in/NRHM/IMEP/IMEPPolicyFramework.pdf (accessed on 20 November 2012).

Ministry of Micro, Small and Medium Enterprises (2002), *Final Results-Third All-India Census of Small Scale Industries, Government of India*. Available at http://dcmsme.gov.in/publications/books/fcensus.htm (accessed on 20 November 2012).

NCMP (2006), 'National Chemical Management Profile for India 2006'. Available at http://www.

cpcb.nic.in/upload/NewItems/NewItem_112_nationalchemicalmgmtprofileforindia.pdf (accessed on 20 November).

Research Foundation for Science, Technology and Natural Resource Policy (Appellant(s)) v. *Union of India & Ors. (Respondent(s))*, the Supreme Court of India Civil Original Jurisdiction Writ Petition No. 657 of 1995 (with SLP (C) No. 16175/1997 & C.A. No. 7660/1997).

Right to Information (RTI) Act (2005), Government of India. Available at http://righttoinformation.gov.in/ (accessed on 20 November 2012).

Toxics Link (1998), 'Lead Acid Battery Recycling in India'. Available at http://www.toxicslink.org/docs/06011_Lead_Acid_Battery_Recycling.pdf.(accessed on 20 November 2012).

——— (2000), 'Pipe dreams: Common Effluent Treatment Plant–Technology, Management and Experience'. Available at http://www.toxicslink.org/pub-view.php?pubnum=38 (accessed on 20 November 2012).

——— (2003), 'Scrapping the Hi-tech Myth: Computer Waste in India'. Available at http://www.toxicslink.org/pub-view.php?pubnum=37 (accessed on 20 November 2012).

——— (2008), 'Food for Thought, Factsheet. Available at http://www.toxicslink.org/ovrvw-int.php?prognum=4&intnum=12&area=2.

——— (2009a), 'Government Opens Floodgates for E-Waste Dumping', Press Release. Available at http://www.toxicslink.org/mediapr-view.php?pressrelnum=99 (accessed on 20 November 2012).

——— (2009b), 'Half Life, Radioactive Waste in India'. Available at http://www.toxicslink.org/mediapr-view.php?pressrelnum=102 (accessed on 20 November 2012).