

E-waste, an environmental, health hazard,

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VISAKHAPATNAM: Walk into any home, office or warehouse and you can be sure to come across electronic junk or old, disused electronic gadgets such as cell phones, electric lamps, tape-recorders, radios, iPods and stereos, CDs, DVDs, batteries, even old TV and computers, fax machines and so on. Unlike kitchen and household waste, which is discarded daily, e-waste accumulates and clutters homes and offices till they are improperly disposed of, harming and polluting the environment.

With the IT revolution as well as industrial and technological advancements, e-waste began being generated mostly in the last two-three decades, especially in India, which has emerged as one of the major hubs of e-waste next to China.

What is worse is that though India is renowned as a global IT hub and certain guidelines for e-waste disposal have been laid down by the Union ministry of environment and forests, no standard protocol is being followed for scientific disposal of e-waste by most states. On the contrary, unscientific procedures like burning e-waste anywhere are being adopted to extract the minute amount of gold and other metals like copper from it, posing a hazard for the environment as well as all flora, fauna and human beings.

Quite a number of World Health Organisation (WHO) studies have proved that radiation is emitted from e-waste, especially discarded cell phones and computer chips even if they are no longer in use and the harmful waves are a perennial source of radiation in the environment.

"Here, e-waste is usually mixed with household waste and finally disposed of at landfills. When dumped outside, the soil or the plants and vegetables grown in the soil are affected by radiation. They mingle with the ground water and also cause pollution because most of the components e-waste are non-biodegradable. In Vizag, used batteries and other e-waste are found discarded in the seas and harm aquatic life too because they contain leach heavy metals like mercury and lead. Radiation itself is carcinogenic and prolonged exposure can definitely cause some kind of cancer," averred general physician Dr Kutikuppala Surya Rao.

"Unlike in European countries, there are no stipulated guidelines or proper disposal mechanisms for e-waste. In some European countries, medicinal plants and herbs are grown inside e-waste, such as in an old computer box or television set. The plants help neutralize radiation effects or rather absorb the ill-effects of e-waste. But no such measure is taken in India," added Dr Rao.

Global NGO Basel Action Network (BAN) has estimated that around 500 million computers in the world contain 2.87 billion kg of plastics, 716.7 million kg lead and 2,86,700 kg mercury. The average 14-inch monitor uses a tube that contains an estimated 2.5 to 4 kg of lead. The lead can seep into the ground water from landfills, thereby contaminating it. If the tube is crushed and burned, it emits toxic fumes into the air.

In a research paper - 'Environmentally Sound Options for E-wastes Management' - written by TV Ramachandra and K Saira Varghese at the Centre for Ecological Sciences, Indian Institute of Science, Bangalore, the eco and health hazards of personal computer (PC) generated e-waste has been elaborately written about.

"PCs contain certain components that are highly toxic such as chlorinated and brominated substances, toxic gases, toxic metals, biologically active materials, acids, plastics and plastic additives. E-toxic components in computers include circuit boards containing heavy metals like lead and cadmium, batteries containing cadmium, cathode ray tubes with lead oxide and barium, brominated flame retardants used on printed circuit boards, cables and plastic casing, poly vinyl chloride (PVC) coated copper cables and plastic computer casings that release highly toxic dioxins and furans when burnt to recover valuable metals," the report stated.

"Computer waste that is landfilled produces contaminated leachates, which eventually pollute the groundwater. Acids and sludge obtained from melting computer chips, if disposed on the ground, cause acidification of soil. Mercury also leaches from certain electronic devices such as when circuit breakers are destroyed and cadmium may leach into the soil and groundwater. Guiyu in Hong Kong is a thriving area of illegal e-waste recycling is facing acute water shortages due to the contamination of water resources," the study added.

Vivek Rathod from NGO Trendsetters, which is associated with environment welfare and solid waste management, said, "In India, e-waste is not recycled or disposed properly but is burned to extract the minute amount of gold and metals like copper from old electronic gadgets. The most hazardous form of burning e-waste is open-air burning of plastics to recover copper and other metals as highly toxic by-products are deposited in the environment. This incineration of e-waste emits toxic fumes and gases, causing air pollution. Unscientifically done e-waste landfill can cause environmental hazards, polluting the soil and water. Uncontrolled fires emanating toxic fumes due to anaerobic decomposition may also occur at landfills."

As per suggestions of environment experts, in industries the management of e-waste should begin at the point of generation. This can be done by waste minimisation techniques and sustainable product design. "Proper control over the materials used in the manufacturing process is an important way to reduce waste generation by establishing material purchase review and control procedures and inventory tracking system to avoid excess purchase. In the approval process, all production materials are evaluated to examine if they contain hazardous constituents and whether alternative non-hazardous input materials are available," suggested Prof Ramachandra.