



THE IMPACT OF HAZARDOUS WASTE AND IT'S IMPACT ON HUMAN HEALTH

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ABSTRACT:

The Urban spread, population growth, rise in living standards, and industrialization has resulted in waste creation in developing countries. Many solid waste sources contribute to hazardous waste which poses many pollution problems. A material is said to be waste when it is discarded without looking to be compensated for its intrinsic value. These wastes may cause hazard to the human health or the environment (soil, air, water) when not properly treated, stored, transported or disposed off which has paid attention both at the international level and at the level of individual countries. Currently in India though hazardous wastes, emanations and liquid wastes are regulated, and the solid wastes often are disposed off carelessly posing health and environmental risk. In view of this, management of hazardous wastes including their disposal in environment friendly and economically viable way is very important and therefore suggestions along with the better strategies are made. Among all of the categories of the wastes, solid waste contributes a major share towards environmental degradation. The purpose of this study is to understand hazardous waste and its impact on human health and to address hazardous waste issues. The results revealed that hazardous waste, when incorrectly treated, processed and disposed off creates air pollution, reduction in water supply and the spread of human diseases. It makes cities untidy and dirty, affects people's health, harms flora and fauna, and hampers the economy of the countries.

Keywords: Hazardous waste; Treatment; Disposal; Management; Regulations; Waste minimization; Remediation

INTRODUCTION:

Urbanization is equal to development which meant generation of waste in form of solid, liquid or gas that finally gets released in the atmosphere (Sefouhi, L et.al.,2010). These wastes are hazardous to environment and affects the livelihood of all living organisms not only due to its nature but World Scientific News 70(Prasadini, P. et.al., 2017) 158-172 -159- also its quantity. Wastes in the form of air emissions contaminating air quality, leaching surface and ground water, biological waste accumulation and soil degradation (Prasadini, P. et.al, 2017). Landfilling of solid hazardous waste pose direct threat to surface and ground water by leaching through soil thus regulating such wastes in a sustainable manner. Water and air emission regulations have been existing since long and

government bodies have been responsive enough for its ground implementation (Pappu, A et.al. 2007) For air and water, almost all comply with the legal requirements laid down by the government but the complexity arises in the case of solid waste management and treatment for the same is mostly not feasible at user site. The complex chemistry of the hazardous solid waste in addition to the toxicity is a major problem. Even though municipal and biomedical wastes are a concern, at present industrial hazardous solid waste is taken under consideration here. Waste stream categorization is a very important and first step to waste management on basis of its chemical constituent to prevent any further mixing Table1 and Table 2 give more broad view

of the industries and the wastes associated with it.

Characteristic of Wastes:

Waste that have not been specifically listed may still be considered a hazardous waste if exhibits one of the four characteristics defined in 40 CFR Part 261 Subpart C - ignitability (D001), corrosivity (D002), reactivity (D003), and toxicity (D004 -D043).

Ignitability. Ignitable wastes can create fires under certain conditions, are spontaneously combustible, or have a flash point less than 60 °C (140 °F). Examples include waste oils and used solvents.

Corrosivity. Corrosive wastes are acids or bases (pH less than or equal to 2, or greater than or equal to 12.5) that are capable of corroding metal containers, such as storage tanks, drums, and barrels. Battery acid is an example.

Reactivity. Reactive wastes are unstable under "normal" conditions. They can cause explosions, toxic fumes, gases, or vapors when heated, compressed, or mixed with water. Examples include lithium-sulfur batteries and explosives.

Toxicity. Toxic wastes are harmful or fatal when ingested or absorbed (e.g., containing mercury, lead, etc.). When toxic wastes are land disposed, contaminated liquid may leach from the waste and pollute ground water posing a hazard to the environment.

Sources of Hazardous Waste:

The term hazardous waste often includes by-products of industrial, domestic, commercial, and health care activities. Rapid development and improvement of various industrial technologies, products and practices may increase hazardous waste generation.

Most hazardous wastes are produced in the manufacturing of products for consumption or further industrial application. Hazardous waste sources include industry, institutional

establishments, research laboratories, mining sites, mineral processing sites, agricultural facilities and the natural environment. All sources that discharge liquid, gaseous or solid wastes that fit the above definition can be regarded as sources of hazardous wastes.

Some major sources are agricultural land and agroindustry, households, mines and mineral processing sites, health care facilities, commercial facilities, institutional facilities, industrial sites, solid waste disposal sites, contaminated sites and building materials. Major hazardous waste sources and their pollution routes in the environment are listed below.

Agricultural land and agro-industry: Hazardous wastes from agricultural land and agro-industry can expose people to pesticides, fertilizers and hazardous veterinary product wastes. Farms are a major source of these wastes, and agrochemicals can leach into the environment while in storage or can cause damage after their application.

Domestic: Households stock various hazardous substances such as batteries and dry cells, furniture polishes, wood preservatives, stain removers, paint thinners, rat poisons, herbicides and pesticides, mosquito repellents, paints, disinfectants, and fuels (i.e. kerosene) and other automotive products. These can present a variety of dangers during storage, use and disposal. Mines and mineral processing sites: Mining and mineral processing sites handle hazardous products that are present in the additives, the products and the wastes.

Health care facilities: Health care facilities are sources of pathological waste, human blood and contaminated needles. Specific sources of these wastes include dentists, morticians, veterinary clinics, home health care, blood banks, hospitals, clinics and medical laboratories.

Commercial wastes: Commercial waste sources include gasoline stations, dry cleaners and automobile repair shops (workshops). The types of hazardous wastes generated by these sources depend on the services provided.

Institutional hazardous waste sources: Institutional hazardous waste sources are mainly research laboratories, research centers and military installations. Some military installations are used for the manufacture and storage of ammunition, and they are also used as testing grounds for military hardware. Military establishments also carry out activities that generate other types of hazardous wastes of household, commercial and industrial nature. Industrial hazardous waste sources: Hazardous wastes are created by many industrial activities. For example, the hazardous wastes from the petroleum fuel industry include the refinery products (fuels and tar), impurities like phenol and cyanides in the waste stream, and sludge flushed from the storage tanks.

Hazardous waste can be a serious threat – although regulations exist, the risk of contamination still occurs if it's not properly managed, leading to inevitable consequences posed to humans and wildlife. Exposure to hazardous waste can be toxic, even fatal in some instances – health conditions impact people of all ages and range from behavior abnormalities to cancer. Let's review some of the negative health effects of hazardous waste.

1)Respiratory Conditions: Exposure to hazardous waste emissions is irritating to your body, especially in your mouth and throat. There is a clear link that exists between waste emissions from air pollution and respiratory health diseases, such as asthma. Studies have shown that people who live closer to sites emitting hazardous waste have an increased risk of developing respiratory conditions.

2) Heart Disease

The risk of disease caused by hazardous waste is not limited to the respiratory system – congenital heart disease is a risk for fetuses of pregnant women that are exposed. Increased risk of stroke and heart attack is another increased risk, often caused by fossil-fuel emissions.

3) Cancer

There has been significant epidemiological research that shows cancer has been linked to sources of hazardous waste, such as air pollution and pesticides that contain carcinogens and other cancer-causing agents. Unfortunately, it can often be found in the home as well – one common example includes radon exposure. Radon is a radioactive byproduct of uranium decay, which according to the National Cancer Institute is the second leading cause of lung cancer.

Temporary Symptoms:

Not all symptoms are chronic – it's very possible to experience acute health conditions from hazardous waste exposure that don't lead to long-term issues. A common example is xylene, one of the most largely used chemicals, found in solvents and paints. Short-term exposure to xylene isn't fatal but often causes headaches, dizziness, and sometimes stomach discomfort. These symptoms will disappear after removing yourself from the exposure and don't tend to linger. That said, long-term exposure to high levels of xylene may cause unconsciousness and even death in severe cases. It doesn't matter how harmless symptoms may seem – the less exposure to hazardous waste, the better for your health. Some hazardous substances can cause far more severe health effects, including:

- behavioral abnormalities,
- genetic mutations,
- physiological malfunctions (e.g., reproductive impairment, kidney failure, etc.),

- physical deformations, and
- birth defects.

CONCLUSION:

In several instances, however, further investigation is warranted to fill important knowledge gaps: in particular, population studies analysing different pathways of exposure, taking into account the characteristics of the site and the contaminants present in each waste site, might provide useful information. Acute respiratory diseases, diabetes and childhood neurological disorders are of particular interest, also in consideration of the strong indications that environmental exposures to EDCs and potential EDCs can cause cognitive and behavioural deficits in humans.

The results of our review, although not conclusive, provide indications that public health policies on hazardous waste management are urgently needed. International, national and local authorities should oppose and eliminate poor, out dated and illegal practices of waste disposal (including illegal transboundary trade), which still affect some communities in industrialized and middle-low income countries, and implement and enforce regulation. Compliance with the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal is necessary to prevent high exposures and consequent health effects, particularly among the vulnerable and the poor.

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