

# Solid Waste Management and Its Impact on Public Health: A Review

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***Abstract- Urbanization and population growth are solely responsible for high increasing rate of solid waste and its proper management a mammoth task in India. The hazardous substances of these waste materials pose a threat to human environment and health. Waste that is not properly managed, especially excreta and other liquid and solid waste from households and the community, are a serious health hazard and lead to the spread of infectious diseases like skin diseases. This review highlights the hazards of solid wastes, the need for its appropriate management and options that can be implemented. Improper disposal of these wastes can leach the heavy metals into soil and groundwater.***

***Indexed Terms- Solid waste management, Environment, Human health.***

## I. INTRODUCTION

Wastes are unwanted or unusable materials. It may be any substance which is discarded after primary use, or is worthless, defective and of no use. These may be municipal waste includes household waste, commercial waste, and demolition waste, Hazardous waste includes industrial waste, biomedical waste includes clinical waste, radioactive waste, explosive waste, and electronic waste. Solid waste is characterize on the basis of their sources, types of wastes produced, rate of generation and its composition. Accurate information in these areas is necessary in order to monitor and control existing waste management systems and to make regulatory, financial and institutional decisions (Alam and Ahmade, 2013).

Solid waste means any garbage or refuse, sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, resulting from industrial, commercial, mining, and agricultural operations, and

from community activities. Daily human activities create solid waste but the real issue is not the creation of it but how it is disposed and what its effect going on to the people and the environment. Solid waste cannot be eliminated realistically speaking; therefore, the focus should be on the effective management of it. If not properly managed, Solid Waste can pose a major risk to human and environmental health. Municipal Waste Management has proven to be inadequate so for effective dispose of this waste management, a holistic approach to be adopted (Zurbrugg, 2003).

Waste management and disposal is an alarming problem encountered by many of the urban and industrial areas in developing economies in Asian countries. Waste generation has witnessed an increasing trend parallel to the development of industrialization, urbanization, and rapid growth of population. The problem has become one of the primary urban environmental issues. Sometimes it is burnt to reduce its volume and to minimize attraction of animals and also to retrieve recyclable items.

Within the past few years we have been suddenly awakened to the dangers caused by the mismanagement of wastes. We are now faced with dealing with past accumulations of wastes, and also with the tremendous task of establishing new guidelines and solutions to combat with ever increasing amount of waste. Uncontrolled hazardous wastes from industries mixing up with municipal wastes create potential risks to human health. There are various types of waste but municipal waste can be properly managed without causing any pollution. Municipal solid waste is now called 'solid waste'. Increasing solid waste management problems and its disposal strikes environment and health hazards. An integrated waste management in sustainable approach is presented as a response to necessary waste management strategy needs. Waste minimization in the form of proper waste segregation and utilization,

the importance of pretreatment of organic waste and combustible waste fraction does not only manage the waste but also generates products such as compost and renewable energy. Direct land filling of commingled waste in Asian countries should be discouraged due to its high organic waste fraction which causes potential environmental emissions.

In the current system the states government takes the responsibility to manage the wastes of every household. This is good but not efficient because over time, the people have come to assume that waste management is solely the government's duty. For an efficient and effective management, the problem has to be tackled from the individual level. Everyone, every household must be actively involved and NGO for waste management must be involved. This is possible by changing the behavior and attitude of individuals towards waste management. Behavioral and attitudinal change can be best achieved through education programs with reward systems.

## II. SOLID WASTE MANAGEMENT

In developing countries, Solid Waste Management is becoming increasingly difficult as it is in most cases solely managed by Municipal authorities, only little amounts of generated wastes is collected and the rest are burned or dumped in any available space in the environment (Ahmed and Ali, 2004). The waste generated as a result of increased consumption of resources can be very harmful to human and environmental health (Frosch, 1996).

There is inadequate data on wastes in most developing nations and this must be address seriously. So, there is an urgent need for a proper system of data collection year after year for each area where there is municipal waste management. The effects of improper waste management including blockage of drainages which encourage flooding, discarded waste serving as breeding grounds for disease vectors (UNDP, 2007) should also be noted. Food waste management is gradually becoming a serious challenge in developing nations; it poses itself as a threat to sustainable development. As a result of the inadequate and inefficient food waste management systems on-ground in most developing countries, these countries are left to deal with sanitary and environmental problems (Thi

*et al*, 2015). The idea of compost to manage food waste has not yet been fully adopted in developing countries.

Depending on their source the solid waste may be Industrial, Institutional, Municipal, Construction and demolition buildings etc (Moeller, 2005). These waste may be Corrosive: these are wastes that include acids or bases that are capable of corroding metal containers, e.g. tanks (Moeller, 2005); Ignitability: this is waste that can create fires under certain condition, e.g. waste oils and solvents; Reactive: these are unstable in nature, they cause explosions, toxic fumes when heated; Toxicity: waste which are harmful or fatal when ingested or absorb.

## III. IMPACT OF SOLID WASTE ON ENVIRONMENT AND HUMAN HEALTH

There are potential risks to environment and health from improper handling of solid wastes. Improper waste management causes all types of pollution: air, soil, and water. Indiscriminate dumping of wastes contaminates surface and ground water supplies. In urban areas, solid waste clogs drain, creating stagnant water for insect breeding and floods during rainy seasons. Uncontrolled burning of waste and improper incineration contributes significantly to urban air pollution. Greenhouse gases are generated from the decomposition of organic wastes in landfills, and untreated leachate pollutes surrounding soil and water bodies.

There are some however the benefit of air pollution for instance, appearance of many aphids are stimulated by air pollutants. Other species are resistant to them and expand to fill the space left by the disappearance of more sensitive kinds. Noise pollution has the potential to affect the physiology, behaviour and reproduction of a range of animal taxa. Types of effects include changes in foraging and reproductive behaviour, reduction in animal fitness, increased risk of predation and reduced reproductive success.

Inappropriately managed waste can attract rodents and insects, which can harbour gastrointestinal parasites, yellow fever, worms, the plague and other conditions for humans, and exposure to hazardous wastes, particularly when they are burned, can cause various

other diseases including cancers. Toxic waste materials can contaminate surface water, groundwater, soil, and air which cause more problems for humans, other species, and ecosystems. Waste treatment and disposal produces significant greenhouse gas (GHG) emissions, notably methane, which is contributing significantly to global warming. Health and safety issues also arise from improper waste management. Insect and rodent vectors are attracted to the waste and can spread diseases such as cholera and dengue fever. Using water polluted by municipal waste for bathing, food irrigation and drinking water can also expose individuals to disease organisms and other contaminants. The U.S. Public Health Service identified 22 human diseases that are linked to improper solid waste management (Alam and Ahmade, 2013).

There are direct health risks of those workers mainly involved in disposal of these waste, who need to be protected, as far as possible, from contact with wastes. Waste worker and pickers in developing countries are seldom protected from direct contact and injury, and the co-disposal of hazardous and medical wastes with municipal waste poses serious health threat. Exhaust fumes from waste collection vehicles, dust stemming from disposal practices and the open burning of waste also contribute to overall health problems. People know that poor sanitation affects their health, especially in developing and low-income countries, where the people are the most willing to pay for environmental improvements (Singh,2013). For the general public, the main risks to health are indirect and arise from the breeding of disease vectors, primarily flies and rats (Alam and Ahmade,2013)

There is specific danger of concentration of heavy metals in the food chain, a problem that illustrates the relationship between municipal solid wastes and liquid industrial effluents containing heavy metals discharged to a drainage system and open dumping sites of municipal solid wastes. These waste causes Chemical poisoning through chemical inhalation, Low birth weight, Cancer, Congenital disorders, Neurological disease, Nausea and vomiting etc (Singh, 2013).

Table. Impacts of heavy metal on Environment and Human Health

| Heavy Metals     | Effects on Environment and Health   |
|------------------|---|
| Lead (Pb)        | Damage the nervous, circulatory and excretory systems. Affects brain development in children. It is a carcinogen and causing lung cancer. |
| Cadmium (Cd)     | Neural damage, Teratogenic effect, Accumulates in kidney and liver.   |
| Mercury (Hg)     | Acutely poisonous and damage to the brain. Respiratory and skin disorders due to bioaccumulation in fishes.                               |
| Chromium VI      | Acutely poisonous and damage the DNA. It causes Asthmatic bronchitis / allergic reactions.  |
| Barium (Ba)      | May develop explosive gases (Hydrogen) if wetted. Short term exposure causes muscles weakness; damage to heart, liver and spleen.         |
| Beryllium (Be)   | Harmful if inhaled the fumes and dust. Causes lung cancer, beryllium disease or berylliosis and skin diseases such as warts.              |
| Arsenic (As)     | Acutely poisonous and injurious to health on a long-term exposure.  |
| Gallium arsenide | Injurious to health   |
| Lithium (Li)     | May develop explosive gases (hydrogen) if wetted.   |
| Nickel (Ni)      | May cause allergic reactions.   |
| Antimony (An)    | It is a toxic compound and causing dermatitis, affecting skin cells and respiratory tract and affects the immune mechanism.               |
| Zinc sulphide    | Toxic when inhaled  |
| Toner dust       | Health risk when dust is inhaled risk of explosion  |

(Source: Kim *et al.*, 1999; DHHS, 2005; Jahan and Begum, 2013)

CONCLUSION

Thus, it can be concluded that urbanization and population growth are solely responsible for high increasing rate of solid waste and its proper management is a major problem of Municipal Corporation. It is found that with increase in the global population and the rising demand for food and other essentials, there has been a rise in the amount of waste being generated daily by each household. Waste that is not properly managed, especially excreta and other liquid and solid waste from households and the community, are a serious health hazard and lead to the spread of infectious diseases like skin diseases.

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