Solid Waste Pollution: A Hazard to Environment

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Abstract

The method of waste disposal in ancient cities was very crude as it was thrown on streets or on the open pits outside the cities. Along with time, efforts were made to throw the waste away from cities because they cause solid waste pollution. Solid wastes are hazard as it adversely affects both biotic as well as abiotic components of the environment. Until recently, solid wastes are disposed outside the city or village limit where they are burnt or compacted.

Modern methods of disposal such as incineration and development of sanitary landfills etc are used to solve the problem. Dumping and burning waste is not acceptable practice from environment and health perspective. The disposal of solid waste should be a part of an integrated waste management plan. This paper will throw some light on the causes and effects of solid waste pollution. It will also state some measures of how can solid waste pollution can be reduced or controlled.

Keywords: Solid waste pollution; Management; Incineration; Recycling; Disposal; Landfill, Composting

Introduction

Wastes are the material that are not needed and are not usable economically with further processing. It may be in the form of solid, liquid, and gas. They originate from the human activities such as agriculture, industry, domestic activities etc. According to origin, waste is classified as domestic, industrial, commercial, clinical, construction, nuclear, and agricultural. According to properties waste is classified as inert, toxic, and inflammable. If these wastes remain untreated, it leads to air, water, soil or solid waste pollution. Hence, solid waste management is very essential [1-3].

Causes of Solid Waste Pollution

Solid wastes are categorized as municipal waste, industrial waste, and hazardous wastes. Municipal waste arises from domestic activities of human beings. Industrial waste arises from industrial activities and hazardous wastes are the substances which causes hazard to plants, animals and human beings. Few of the common hazardous waste is radioactive substances, chemicals, biological wastes, flammable wastes and explosives [4,5].

Over population

Is a Great Factoring Which Influence the Rise in Pollution.

Urbanization

Solid waste is an urban problem where people have the habit of using of variety of commodities and discarding them afterwards.

Affluence

In an affluent society, the per capita consumption is very high and people discard many items regularly, which increase solid waste to a large extent.

Technology

It has changed the culture of using things. It is distinctly apparent in package industry for most economic goods. There is a shift in technology from the returnable packaging to non-returnable packaging. For example, the returnable glass container or bottles are being replaced by non-returnable cans, plastic containers, plastic bottles etc. Since packaging materials like those made from plastic and non-biodegradable, they are largely responsible for causing solid waste pollution [6].

Effect of Solid Waste Pollution

Solid waste can pollute air, water and soil, and leave various environmental impacts, and cause health hazard, due to improper handling and transportation. These adverse effects are seen on health and environment, some of them are as follows:
Environmental impacts

1. Leachates from refuge dumps percolates into the soil and contaminate underground water.
2. Scavengers and stray animals invade the roadside garbage and litter the waste over large area causing much aesthetic damage to the atmosphere [7].
3. Waste products when burnt like plastic and rubber pollute the atmosphere with noxious fumes.
4. Organic solid wastes emits obnoxious odor on their decomposition and make the environment polluted.

Health hazards

1. Vectors like rats and insects invade refuse dumps and spread various diseases.
2. During handling and transfer of hospital and clinic wastes, disease transmission may take place.
3. Water and food contamination through flies causes various diseases in humans as dysentery, diarrhea and amoebic dysentery.
4. Rats dwelling with infectious solid wastes may spread diseases like plague, salmonellosis, trichinosis, endemic typhus etc.
5. Water supply, if gets contaminated with pathogens present in solid wastes, may result in cholera, jaundice, hepatitis, gastro enteric diseases etc.
6. Choking of drains and gully pits by the solid wastes results in water logging which facilitates breeding of mosquitoes and results in the spread of diseases like malaria and plague.
7. Minimart-It is a case of human mercury poisoning which occurred in minimart bay in japan. A large plastic plants located near the minamata bay used mercury to produce vinyl chloride, the left over mercury was dumped into bay which entered in tissues of fish, which in turn were consumed by people living in that area. The contaminated fish thus caused an outbreak of poisoning, killing and affecting several people [8].

Control of Solid Waste Pollution

Disposal

It is done most commonly through a sanitary landfill or through incineration. Landfills- a modern sanitary landfill is a depression in an impermeable soil layer that is lined with an impermeable membrane. In it solid waste is placed in a suitably selected and prepared landfill site in a prescribed manner. The waste material is spread out and compacted with appropriate heavy machinery. The waste is covered each day with a layer of compacted soil [9].

Incineration: it is the process of burning municipal solid waste in a properly designed furnace under suitable temperature and operating conditions. It reduces the municipal solid waste by about 90% and 75% by weight.

Composting: bacterial decomposition of organic components of the municipal waste result in the formation of humus or compost and the process is known as composting. It helps in disposal of solid waste, disposal of night soil, and production of valuable manure for crops, it is also termed as biodegradation [10].

Recycling

It means reusing some components of the waste that may have some economic value. Recycling conserves resources, reduce the energy used during manufacture and also reduce pollution.

Source recovery (pyrolysis)

it is a kind of destructive distillation in which the solid wastes are heated in pyrolysis reactor at 650-1000 degree centigrade in oxygen depleted environment. By this process, the chemical constituents and chemical energy of some organic wastes are recovered. The organic constituents split up into gaseous liquid and gaseous fractions like carbon dioxide, carbon monoxide, tar, methane, charred carbon etc [11].

Source reduction

it is one of the fundamental ways to reduce waste. This can be done by using less material when making a product, reusing products, designing products packaging to reduce their quantity. Individually one can reduce the use of unnecessary items which causes solid waste [12,13].

Conclusion

From the above study it is concluded that it is the immense need of present times to get rid from solid waste pollution. It can be controlled effectively through solid waste management. As it is a difficult task, its main objectives are to reduce the harmful effects and find ways for their utilization. Solid waste is harmful for the environment whether it exists in solid, liquid or gaseous form. Solid waste pollution is caused mainly through urbanization and through industrial waste. It causes various diseases in human as bacillary dysentery, diarrhea and amoebic dysentery, plague, salmonellosis, trichinosis, endemic typhus, cholera, jaundice, hepatitis, gastro enteric diseases etc. Hence, management of solid waste is very essential, it helps in reducing solid waste pollution and creates pollution free and clean environment. Various methods are practiced to control solid waste pollution as composting, recycling, incineration, pyrolysis, disposal, landfills etc. Hence, solid waste management reduces or controls the solid waste pollution and its hazardous effects.
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