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Solid Waste Management; Clean India by Reduce Solid Waste

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I. INTRODUCTION

a) Solid Waste Management

"Solid waste" means any garbage, trash, refuse, abandoned material, by products, scrap, ash, sludge, and all discarded material including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, and agricultural operations, and from community activities. Solid waste is cause of pollution in two ways i.e. direct or indirect. In direct way pollution is land pollution and in indirect way pollution is Air and Water pollution.

Human and animal activities generate many wastes that are discarded as useless or unwanted. These are mainly solid and result in landscape pollution. Landscape pollution is the 3rd important pollution after Air and Water pollution. Landscape pollution is the 3rd important pollution after Air and Water pollution. And after land pollution, then this solid waste mixed with Air and Water then it becomes Air and Water polluting agent. The solid waste has adverse effect on the life of human being and environment. The solid waste reduces the aesthetic look of the city. The reasons of this effect is by common people who thrown solid waste openly in open space. In every city in India; the solid waste handling is very poor. The solid waste increased rapidly day by day in India due to increases in population and change in life style.

b) Types of Solid Waste

- Industrial solid
- Municipal solid waste (MSW)
- Hazardous, toxic, waste
- Construction waste
- Food processing waste
- Bio-medical waste
- Nuclear waste
- Agricultural waste

c) Process of Solid Waste Management

i. Primary Pollution and Waste Prevention

- a. Change industrial process to eliminate use of harmful chemicals.
- b. Use less of a harmful product.
- c. Reduce packaging and materials in products.
- d. Make products that last longer and are recyclable, reusable, or easy to repair.

ii. Secondary Pollution and Waste Prevention

- a. Reuse.
- b. Repairs.
- c. Recycle.
- d. Compost.
- e. Bye Reusable and Recyclable product.

iii. Waste Management

- a. Treat waste to reduce toxicity.
- b. Incinerate waste.
- c. Bury waste in landfills.
- d. Release waste into environment for dispersal or dilution.

d) Objectives of Solid Waste Management

Solid waste becomes a dangerous thing if we are not handling it properly. It is directly cause of spread many types of disease, dirtiness and pollution. It is the main reason to destroy aesthetic look of our city. The main objective of solid waste management is to improve the quality of life. The objective of solid waste management is to reduce the quantity of solid waste disposed off on land by recovery of materials and energy from solid waste. This in turn results in lesser requirement of raw material and energy as inputs for technological processes. Such techniques and management programs have to be applied to each and every solid waste generating activity in a society to achieve overall minimisation of solid waste.

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e) Drawbacks of the Present System

- Municipal Corporation is not doing their job properly in India.
- No proper storage system of waste at source.
- No system of primary collection from door to door.
- Irregular lane sweeping at.
- Waste storage depots have been a problem.
- Transportation of waste is not satisfactory in India.
- Poor handling of waste in India.
- Disposal of waste is a neglected area of SWM services and the current practices are grossly unscientific.
- No Awareness among people regarding the solid waste reduction.
- Lack of public participation.

II. GROWTH OF SOLID WASTE IN INDIA

In India rapid growth of Municipal Solid Waste from 1990 to 2010 as shown in figure no:-1. The graph shows that the projected solid waste collection rising upto 235 Million Tonnes/ Year in financial year 2041. These rising line also shows that, how the Indian cities converted to dirtiness.

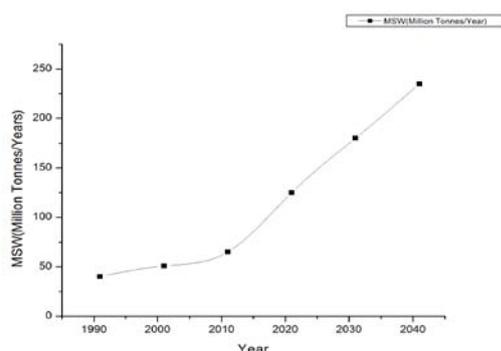


Figure 1

III. LITERATURE REVIEW

Cities in India with growing population, changing life styles, migration of people from rural areas to urban areas and rapid industrialization end up generating an enormous quantity of urban waste (Municipal Solid Waste - MSW) every day. By and large, the Municipal Bodies / Urban Local Bodies ("ULB") in various cities/towns collect MSW, transport it to the dump yards and dispose it off in open ground dumping or non-sanitary landfill. These landfill sites are an environmental hazard – emanating methane causing greenhouse effect, smell & dirt causing health problems, and leachate contaminating the ground water, etc.

The issue was taken-up by some NGOs in the Supreme Court, following which the MSW Handling & Management Rules 2000 have been framed. All the ULB's were directed by Ministry of Environment & Forests, Government of India (MoEF, GoI) to set up

municipal waste processing facilities, however, not a single ULB could implement the directive because of various constraints. It is reported that most of the ULBs are getting summons from the Court of Law for not complying with Supreme Court directives for setting up municipal waste processing facilities and this has caused an urgency to support the ULBs for setting up such facilities. The challenges now being faced by solid waste management in China include reducing the quantity of waste from the source, promoting the recycling of solid waste, improving disposal levels and reforming solid waste management systems [1]. Proper management of Bio medical waste is a concern that has been recognized by both government agencies and the Non government organizations [2]. The existing dumping grounds are being used for construction of commercial and residential complex. Due to the chemical reactions below the ground, obnoxious gases emit throughout the year. However it is intensified during summer and affects the human health, damage sensitive equipments like computers, electronic devices etc. Our country desires to have a scientific method of disposal of Municipal Solid Waste [3]. SWM, which was one of the most poorly managed civic activity, has transformed into one of the most well managed one [4]. Proper treatment, storage prior to treatment or disposal and safe disposal of HWs is essential for environmental health [5]. Proper treatment, storage prior to treatment or disposal and safe disposal of HWs is the need of the hour [6]. Open dumping of solid waste affect the aesthetic value of the surrounding area of the disposal site. It also produces very bad smell at the time of decomposition process. At the time of decomposition it released a various gases within the surrounding area due to that air get polluted and this pollution leads to global warming [7].

Solid Waste if not disposed and managed properly, negative impacts will take over and kill the destination [8]. The main challenge in applying MSW sorting at the source programs has to do with the correspondingly high level of citizen involvement in dispensing the different waste materials that comprise MSW into different waste bins, either inside or outside the household [9]. MSW generation is over-riding the population growth in Indian mega-cities [11]. The new and alternative building construction materials developed using agro-industrial wastes have ample scope for introducing new building components that will reduce to an extent the costs of building materials [15]. In an optimistic view, the process of globalization may render the world's development more sustainable simply by pushing the world economy towards the decreasing part of the bell-shaped Environmental Kuznets Curve [16]. PPP system focuses on processing of waste without improving the collection and transportation activities, which leads to a higher cost per ton of waste management [20]. In most of the cities, the waste quantity is not measured and is usually assessed

based on number of trips made by transportation vehicles [23]. There is a need to integrate the role of different stakeholders involved in waste management [25]. A reliable approach is to be critical and creative; to start from the existing strengths of the city and to build upon them; to involve all the stakeholders to design your own models; and to 'pick and mix', adopt and adapt the solutions that will work in your particular situation [29]. Agricultural utilization of MSWC is the most cost-effective MSW management option over traditional means such as land filling or incineration as it enables recycling of potential plants nutrients [33].

Measures must be taken to diminish leachate production and to monitor the groundwater of the surrounding area, even after taking remedial actions [49].

IV. ROLE OF HUMAN BEING TO REDUCE SOLID WASTE

Everyday Solid waste is increase by human beings in every city by thrown waste in open space. These solid wastes include plastic, papers, cans, disposal, kitchen waste and rotted vegetables etc. This increases the dirtiness of the city and cause to increase pollution and diseases. We always blame public and government sectors to control pollution through controlling market mechanisms and government blaming people to avoid and check pollution. Who would control whom? Many ecologists and environmental scientists believe in that pollution problems can be overcome by using market mechanisms to reduce solid waste problems rather than rigid rules and regulations. Man could achieve this by identifying his own role at individual level in prevention of pollution. This is possible through environmental awareness, education and enlightenment. We are needs to search the most viable, efficient and economical ways to eliminate pollution problems.

Waste disposal at personal level should be optimally reduced as waste destruction by any means causes pollution. Timely disposal of waste to prevent decomposition of household refuse as to check foul odours and spread of disease by insects, flies and other pathogenic bacteria and service centres of vehicles should minimize the disposal of organic solvents into the main drains. So reduce the use of plastic bags and thrown waste by only in bins; if possible using different bins for different waste and also reduced the wastes by reducing the marriages party arrangements throughout the India. Another thing is that paper is not waste; if it used for recycled. We will redesign manufacturing processes and products to use less material and energy, redesign manufacturing processes to produce less waste and pollution. We can develop products that are easy to repair, reuse, remanufacture, compost, or recycle and eliminate or reduce unnecessary packaging.

If we will refuses the packaging where it should possible. And establish cradle-to grave responsibility. There is need for restructure of urban transportation systems and using e-mail or text messaging in place of paper mail. The news papers and magazines should be read online. The Reduction in office paper waste by implementing formal policies to duplex all drafted reports and by making training manuals and personnel information available electronically. The implementation of Work with customers to design and implement a packaging return program and Switch to reusable transport containers. There should be Reduction in office furniture and supplies, such as interoffice envelopes, file folders, and paper.

V. PROBLEM FORMULATION

In our society people were not aware to use this type of solid waste and not get the proper education to handle them. Collection of solid waste are not proper; it is always collected in mixed way and collected place are not proper maintained. There are need to introduce technology and institution and regulatory the framework to handling the solid waste. Large metropolitan areas have the greatest difficulty dealing with solid waste. Nations with a higher standard of living tend to produce more municipal solid waste per person than less-developed countries.

- Over population
- Rapid Technology advancement
- Packaging materials
- Urbanization
- Lack of awareness
- Lack of public participation
- Poor enforcement of laws
- Lack of political will to properly enforce and comply with
- Lack of clarity and overlapping of competences of different public organs
- Lack of controlling and monitoring of entities in charge of waste collection facilitates corruption in WM at public and private levels
- Lack of involvement of citizens in the WM decision making process at public levels deters the identification of community concerns and needs regarding life conditions.

VI. EFFECTS OF SOLID WASTE ON ENVIRONMENT AND LIVING BEINGS

- GHGs are accumulating in Earth's atmosphere as a result of human activities, causing global mean surface air temperature and subsurface ocean temperature to rise.
- Rising global temperatures are expected to raise sea levels and change precipitation and other local climate conditions.

- Changing regional climates could alter forests, crop yields, and water supplies.
- This could also affect human health, animals, and many types of ecosystems.
- Deserts might expand into existing rangelands, and features of some of our national parks might be permanently altered.
- Some countries are expected to become warmer, although sulfates might limit warming in some areas.
- Scientists are unable to determine which parts of those countries will become wetter or drier, but there is likely to be an overall trend toward increased precipitation and evaporation, more intense rainstorms, and drier soils.
- Whether rainfall increases or decreases cannot be reliably projected for specific areas.
- Activities that have altered the chemical composition of the atmosphere:
 - Buildup of GHGs primarily carbon dioxide (CO₂) methane (CH₄), and nitrous oxide (N₂O).
 - CO₂ is released to the atmosphere by the burning of fossil fuels, wood and wood products, and solid waste.
 - CH₄ is emitted from the decomposition of organic wastes in landfills, the raising of livestock, and the production and transport of coal, natural gas, and oil.
 - N₂O is emitted during agricultural and industrial activities, as well as during combustion of solid waste and fossil fuels. In 1977, the US emitted about one-fifth of total global GHGs.
 - Hazardous for worker who come in direct contact.
 - Disease may transmit during handling and transfer of biological waste.
 - Rats which invade refuse dumps for food can spread plague, salmonellosis etc
 - Flies breed on refuse dumps and transmit many disease like bacillary dysentery, diarrhoea etc.
 - Large scale epidemic of cholera, gastro intestinal diseases, jaundice, hepatitis etc. Result from contamination of soil and water bodies.
 - Choking of drains and gully pits.
 - Water logging results in breeding of mosquitoes in stagnant water.
 - Undergo decomposition and befoul the air with obnoxious odours
 - On burning produce smoke and cause air pollution, Global warming and can cause acid rain etc.
 - Groundwater contamination from a waste disposal site.

VII. ROLE OF HUMAN BEING TO REDUCE SOLID WASTE

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VIII. CONCLUSION

After the study we found that there is need for the cleanliness of Indian city. There is need PPPs projects and also need a cooperation of every people in city for cleanliness. And after study we also found that there is lot of weakness in common man and government employee to managing the solid waste. And there is need to follow the suggestion that described below.

- 1) There is need of reduction in occasion parties to solve the problem of food wastes.
- 2) Two bin systems are required in every Indian city for solid waste and Bins to be posted at frequent tourist destinations and market places, bus stands and bus stops. The collection of waste in the bins should be done regularly and the waste collected disposed of properly.
- 3) The Government plays a very major role in setting up MSW (Municipal Solid Waste) management plants, to support research and take action as necessary to implement rules and regulations relating to conservation and protection of the environment as it is fragile.
- 4) Dumping should be strictly controlled by night patrolling and proper precautions be taken since it is the disposal of solid waste.
- 5) There is need for implementation of 4R principles.
- 6) Municipal Solid Waste (Management and Handling) Rules 2000 should be strictly adhered to by every municipality.
- 7) Plastic bags for packaging should be banned and stopped where ever possible.
- 8) Environmental Audit to be conducted for Indian city.
- 9) Awareness programmes are held regularly to make the tourist and locals aware of the need to conserve and preserve the "Nature – Mother Earth".
- 10) Voluntary societies should be there which will take the initiative for awareness programmes and training to peoples for handling of solid waste. The example of such kind of society is GSWF, Sirsa (India).

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