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Impact of Urban Waste on Health and Environment: An Appraisal

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Abstract

Waste is the unwanted material disposed off into the environment. Any substance which is discarded after primary use or is worthless, defective and of no use is a waste. In urban areas, disposal of waste is an issue as there is very limited area of space to dispose off the garbage, so it is becoming an alarming issue in relation to health and environment. The most populous countries like China and India are the significant contributors of huge amount of waste in towns and cities. Thus, it is a big issue now for the entire world to think critically and systematically for the proper disposal of waste in urban areas and to convert this waste to wealth. Today, technologies have progressed much, which could salvage the problems of waste. Indiscriminate disposal of solid waste in dumpsites located within urban areas have proved to be a health hazard to nearby residents in most developing cities. Open dumps have major public health

threats. The excreta and other liquid and solid waste from households and the community are a serious health hazard that led to the spread of infectious diseases. This study is based on the secondary data collected from various sources. This highlights the sources of urban solid waste and its type, the impact of improper waste management causing health and environmental problems, the suggestions for proper use of waste in urban areas and finally the paper is like a clarion call to the public that this problem can only be checked or controlled through the combined efforts of every individual by creating awareness to the masses.

Keywords: Urban waste, waste management, health, environment, diseases and pollution etc.

Introduction

Human beings discard a lot of materials every day that are useless and unwanted. Solid waste is generated from various sources like industrial, residential and commercial activities of men. So, in simple term waste produced such sources in urban areas are called urban waste. This waste includes any garbage, refuse or sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations (US Law-Solid Waste Act 2, 1999). Urbanization in developing countries has created an increased growth of informal settlements. This growth is taking place on such a scale that Central and State governments find it very difficult to cope with the demand for appropriate housing conditions.

At the city level, this is most noticeable in the sphere of infrastructure. Services often fail to reach new low-income areas, while existing municipal services rapidly deteriorate (UNCHS, 1989). The United Nations Development Program survey of 151 mayors during the International Conference, in 1997, identified insufficient solid waste collection and disposal to be among the 5 most severe problems in cities world-wide (UNDP, 1997). This numbers show the importance of well-functioning waste management systems and the necessity of making improvements in this field. Management of solid waste is an enormous challenge in developing countries all over the world due to factors like; poverty, population explosion and urbanization. The management is also in-effective and under-funded by governments (Adewale, 2011). Senkoro (2003) argued that waste management is the second most pressing matter after the problem of inadequate water quality within all developing nations (as cited in Adewale, 2011).

Appropriate waste management has been one of the biggest challenges that many urban authorities have been facing. Generally richer areas of cities have had a good or at least satisfactory waste collection system but, in most cases, the same does not happen in low-income housing areas and informal settlements. Besides the collection, it is also necessary to treat and dispose the waste properly and this constitutes one of the biggest challenges that cities face. Unmanaged wastes become a source of contamination and disease (UNCHS, 1989).

Rationale of the Study

A sustainable solid waste management system is required for any place especially in the urban areas to tackle the problem of haphazard waste disposal. With rapid growth of population and development, waste production is on the rise. Although

the generation of waste has been rapidly increasing, yet the capacity to collect and safely dispose of the material has been on a general decline. Today municipal solid wastes are getting disposed in open and illegal dump sites which lack of proper environmental pollution control and monitoring (Rotich Henry et al, 2006). The particular concern of unmanaged wastes arise during rainy season, high temperature and when there are settlements in close proximity or the low-lying areas. The run-off and high humid conditions increase the health hazards. The landfill sites become prone to soil and ground water contamination due to leachate percolation. Open dumping of garbage serves as breeding ground for disease vectors like flies, mosquitoes, cockroaches, rats and other pests. High risk of spreading diseases like typhoid, cholera, dysentery, yellow fever, encephalitis, plague and dengue fever also exist in such an environment (TERI, 2006). Other risk of burning of wastes and open dumping are the air pollution to instigate respiratory and skin diseases besides contributing greenhouse gases into the atmosphere. The municipal solid waste management becomes increasingly important as countries expand their economies and urban population keeps on increasing (IGES, 2006a; Fernandez, 1997). Unmanaged urban waste is a dangerous threat to the human environment today. Proper waste management is needed to reduce health problems, water pollution and other environmental hazards, besides the negative aesthetic impacts. Thus it is a universal problem needs to be studied in larger aspects.

Objective of Study

The specific objectives of the study are:

1. To know the sources of urban waste and its type.

2. To investigate the major cities of India producing waste and its treatment.
3. To study about the impact of waste on environment and especially on human health.
4. To know the cities/towns in India having proper landfill areas and the number of waste processing plants.
5. To keep some suggestions for creating awareness and better management of wastes.

Methodology

This is a descriptive study based on secondary data procured from reputed sources like articles of National and International refereed research journals, books, websites, magazines, census reports, reports of the planning commission and other relevant documents.

Analysis and Interpretation

This section is devoted to analysis and interpretation of data. The data obtained through the procedure do not serve the purpose unless it is systematically classified, tabulated and interpreted, in consistent with the inherent meaning and scope of the problem. Tabulation denotes the recording of the classified data in quantified terms.

Bases of Urban Waste and its Kind

Urban waste usually comprises of waste from hospitals, from homes, offices, markets, small cottage units, manufacturing units, horticulture waste, waste of the gardens, harmful wastes from industries and from construction sites etc.

i) **Waste from households -** Wastes from households cover a variety of rejected materials like polyethylene bags,

aluminum cans, scrap metals, glass bottles, waste papers, diapers, cloths and food waste etc.

ii) **Demolition and Building wastes** – The waste produced from buildings and other structures are regarded as demolition wastes. Similarly, the wastes created from construction, renovation and repairing of individual houses, commercial buildings and other structures are classified as building wastes.

iii) **Biomedical waste** – Biomedical waste includes anatomical wastes, pathological wastes and infectious wastes etc.

iv) **Unusual wastes** – Unusual wastes such as street sweepings, roadside litter, catch basin remains, dead animals and abandoned vehicles etc.

v) **Waste from shops** – Shop waste consists of waste paper, packaging materials, cans, bottles, polyethylene bags, peanut shells, egg shells, tea leaves, etc.

vi) **Gardening and slaughter houses waste** – Gardening and slaughter houses waste includes vegetable parts, residues and remains of slaughtered animals etc.

vii) **Harmful waste** – Chemical, biological, flammable, explosive or radioactive wastes that are harmful to human civilization are considered as harmful wastes.

viii) **Industrialized waste** – Industrial wastes involve a large number of materials including factory rubbish, packaging materials, acids, alkalis and metals etc.

Present Scenario of Urban Waste Management in India

There is a pathetic condition of urban waste management disposal in India. Unprecedented growth of population

is directly or indirectly the reason behind it. Hence, it is a high time for this country to execute mechanized planning for the treatment of urban waste in small and big towns and cities. More than 90 percent wastes in India are dumped in an unacceptable manner. It is estimated that approximately 1400 km was occupied by waste dumps in 1997, so we can assess the present situation as compared to the growth of population today and this is expected to increase many more times in the near future. Table below is showing the State-wise status of waste processing facilities in India in 2011.

The Central Pollution Control Board (CPCB) consulate Annual Report of 2015-16 states that the total quantity of waste generated was 1,35,198 TPD (Tons per day), out of which 1,11,028 TPD was collected, 25,572 TPD treated and 47,456 TPD landfilled. As per the data of the Housing and Urban Affairs Ministry data, out of over 1.43 TPD of solid waste generated across the country, only about 33,800 TPD (23.73 percent) was being processed on 31st January 2018.

The "Swachh Bharat Abhiyan" or "Clean India Mission" is a major campaign initiated by the Government of India. This was launched on 2nd October 2014, the birth anniversary of Mahatma Gandhi, to tackle the problem waste in India. Through this initiative, a number of schemes have been introduced to assist both the authorities and the public in achieving the vision towards a clean India mission. Towards this end, the government of India adopted the Solid Waste Management Rules, 2016 (SWM Rules) in supersession of the Municipal Solid (Claudia E. Saldana Duran and Sarah Messina (2019) Waste (Management and Handling) Rules, 2000 to address the rampant waste generation.

Table 1: Waste Processing Plants (Facilities) Available In India

Name of the States	Composting	Vermicomposting	Biomethanation	Pelletization	Waste to Energy
Andaman and Nicobar	1	Nil	Nil	Nil	Nil
Andhra Pradesh	24	Nil	Nil	11	2
Assam	1	Nil	Nil	Nil	Nil
Chandigarh		Nil	Nil	1	Nil
Chhattisgarh	6	Nil	Nil	Nil	Nil
Delhi	3	Nil	Nil	Nil	3
Goa	14	Nil	Nil	Nil	Nil
Gujarat	3	93	Nil	6	Nil
Himachal Pradesh	10	Nil	Nil	Nil	Nil
Jharkhand	4	Nil	Nil	Nil	Nil
Jammu Kashmir	1	Nil	Nil	Nil	Nil
Kerala	21	7	10	1	1
Madhya Pradesh	7	Nil	Nil	2	Nil
Maharashtra	6	2	5	5	2
Meghalaya	1	1	Nil	Nil	Nil
Nagaland	1	1	Nil	Nil	Nil
Odisha	1	Nil	Nil	Nil	Nil
Punjab	1	3	Nil	Nil	Nil
Sikkim	1	Nil	Nil	Nil	Nil
Tamil Nadu	162	24	Nil	3	Nil
Tripura	1	Nil	Nil	Nil	Nil
West Bengal	13	7	Nil	Nil	Nil
Total	279	138	15	29	8

(Source: Planning Commission of India, 2014)

Landfill

Most of the countries in the world put their waste on the ground in a very unscientific manner which causes lot of harm to the entire human civilization. India is also one of them. Throwing away of waste in a landfill includes hiding the waste and this remains a common practice in most of the countries. Each and every town and cities should have sufficient landfill sites and it should be far away where human beings do not reside which is hardly seen in a populous country like India.

Table 2: Landfill Sites of Different Cities in India

Name of the city	Number of Landfills	Area of Landfills (Acres)
Chennai	2	465.5
Coimbatore	2	292
Surat	1	200
Greater Mumbai	3	140
Greater Hyderabad	1	121.5
Ahmadabad	1	84
Delhi	3	66.4
Jabalpur	1	60.7
Indore	1	59.5
Madurai	1	48.6
Greater Bangalore	2	40.7
Greater Vishakhapatnam	1	40.5
Ludhiana	1	40.4
Nasik	1	34.4
Jaipur	3	31.4
Srinagar	1	30.4
Kanpur	1	27
Kolkata	1	24.7
Chandigarh	1	18
Ranchi	1	15
Raipur	1	14.6
Meerut	2	14.2
Guwahati	1	13.2
Tiruvanthapuram	1	12.5

Source: Parvathamma, Govt. of India, 2014.

A proper well-designed landfill will never be harmful rather hygienic one. Unsystematic landfill areas near town and cities are causing lot of adverse impact on environment and human health. In the following table 2, landfill sites available in Indian cities along with their numbers and areas are mentioned.

Impact of Waste on Environment and Health

According to Marshal (1995) open dumpsites are a major problem to the environment, especially in the air that the people breathe in. Dumpsites produce unbearable smells and smoke that cause illness to people living in and around or closer to them. Wrensh (1990) further stated that in some sites, explosive organic chemicals have been detected in adored air of homes nearby dumpsites. According to Dolk (1997) dump sites closer to residential areas are always feeding places for dogs and cats. These pets together with rodents carry diseases with them to nearby homesteads. The UNEPA (2006) stated that wastes that are not properly managed especially excreta and other liquids and solid wastes from households and the community are a serious health hazard and could lead to the spreading of diseases. The report further stated that unattended wastes lying around attract flies, rats, and other creatures that in turn spread diseases. Medina (2002) reported that direct dumping of untreated wastes in rivers, oceans, and lakes result the accumulation of toxic substances in the food chain through the plants and animals that feed on it. This clearly shows how waste disposal seriously affects the health of residents located closer to dumpsites. US Environmental Protection Agency (2006) revealed that disposal of solid waste on the land without careful planning and management can present a danger to the environment and the human health. The environment should be clean and less polluted by

all means. This means that waste should be managed at all costs to limit its effects to the environment.

Dumping waste in any place is dangerous. When it is stored in a particular place for a long-time various bacterium, worms, viruses etc. take birth and move to different areas where human beings reside. Water, air and soil get polluted and its adverse impact on human health causes lot of harm. It is a very alarming problem not only for some specific countries, rather it is seen in almost all the countries of the world today. Therefore, the problem of waste and its consequences on health and environment has become an international issue. Number of communicable diseases like cholera, diarrhea, dehydration etc., are the results of waste stored in any place. A variety of cancer in agricultural land is also experienced by farmers in a large number in many states of India. Gathering of heavy metal particles and harmful gases from different industries are having lot of adverse impact on human health. Children at their tender age are losing their eye sight and skin diseases are very common. Waste like cans, pesticides, plastics, batteries, cleaning solvents, radioactive matters, paper, scraps etc. cause serious bad effects on manhood. Animals are also affected by taking poisonous waste and polyethene. These serious health hazards are only because of the carelessness of human beings. Wastes sometimes create fire in the farm and forests which produces dioxins, furans and polychlorinated biphenyls. It is a man-made problem which can be checked if varieties of wastes are treated in a scientific and mechanized way. So regardless of the origin, contents or hazards potential, urban waste must be managed systematically to ensure environmental best practices. Since solid waste management is a critical aspect of environmental hygiene and protection of human health, it needs to be incorporated into environmental planning and

administration. It should also be managed according to the prescribed norms of the medical sciences to prevent the spread of diseases out of the wastes disposed at the dump sites.

Findings

i) The current status of waste management in India is poor. Appropriate methods of waste collection to disposal are not being used. There is a lack of training in waste management and the availability of qualified waste management professionals are limited.

ii) Many states, union territories, cities and towns of India are not having proper waste processing plants and the landfill sites are also very less in comparison to the population.

iii) Landfill sites are situated very nearer to the human inhabited areas in most towns and cities.

iv) Municipal authorities are of course responsible for managing municipal waste in India but the budget allotted are insufficient to cover the costs associated with developing proper waste collection, storage, treatment and disposal.

v) Indifferent attitude of public to wastes are also a major barrier in India.

vi) Waste dumps have adverse impacts on the environment and public health.

vii) Odor is a serious problem, particularly during the summer when average temperatures in India exceed 45°C.

viii) Water-borne diseases such as typhoid, diarrhea, dysentery, hepatitis A and occasionally cholera are currently a serious public health problem because of unmanaged urban wastes.

ix) Uncontrolled burning of wastes at dump sites releases very dangerous smoke which is a major cause of respiratory diseases and cause pollution.

x) The impacts of poor waste management on public health are immense with increased incidences of nose and throat infections, breathing difficulties, inflammation, bacterial infections, anemia, reduced immunity, allergies, asthma and other infections.

Suggestions

i) There should be some group of people who can visit different places of different sections of society for creating awareness about health and environment.

ii) Messages in Newspapers, magazine, T.V and Radio should be circulated for protecting the environment.

iii) Seminars should be organized on the subjects related to pollution.

iv) There should be a group of people (social workers) who can visit rural areas in all festivals, functions, local gatherings and religious occasions to convince the people for preventing pollutions.

v) Awareness should be created among the students in schools, colleges, universities and other organizations and also organize rallies for public consciousness.

vi) World forest day, world environment day and other important functions should be observed for general awareness.

vii) There should be a check/control of population growth.

viii) Emphasis should be given on public transport and people should be encouraged to use cycle for covering short distance which is a good exercise for better health.

ix) In every town and cities even small market places should have the landfill sites which are at far from the inhabitants and it should be properly managed.

x) Municipals in all the states and union territories should be strengthened with good amount of budget for proper management of wastes.

xi) All the states should have the provision for making energy, compost and vermin compost etc. from varieties of wastes.

xii) Farmers should be discouraged to use pesticides and fertilizers and encouraged to use bio fertilizers in agriculture fields.

Conclusion

The poor management of urban waste in India is resulting serious health hazards. The uncontrolled and un-scientific dumping of solid wastes is a big headache today. Surface and ground water is getting polluted and number diseases are the outcome of this contamination. Water-borne diseases such as typhoid, diarrhea, dysentery, hepatitis A and occasionally cholera are presently a serious public health issue. This study shall act as a guide for the government, policy makers, NGOs and the public to take necessary measures to check urban solid waste in small towns and cities. Hence, the government should allocate a good amount of money for the proper management of urban solid wastes in order to avoid high risk to both human health and the environment.

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