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Increasing Urbanization And Challenges Of Solid Waste Management In India

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Abstract

Solid waste management and urbanization have emerged as a global challenge in the changing environment. Most of the developing countries are facing challenges arising out of increasing population. India is also not untouched by this problem. Urbanization and solid waste management are positively related to each other and due to this there is an unprecedented increase in the amount of solid waste in the cities. The changing lifestyle of people, increase in consumerism and indifference among people towards waste management add to this problem. The present research paper mentions the current status of urbanization and solid waste management in India, as well as analyzes the factors related to solid waste management and urbanization. This research paper explains the factors responsible for the proper arrangement of solid waste management in India and the challenges arising due to lack of proper management of solid waste.

Key words: Solid Waste Management, Urbanization

Introduction

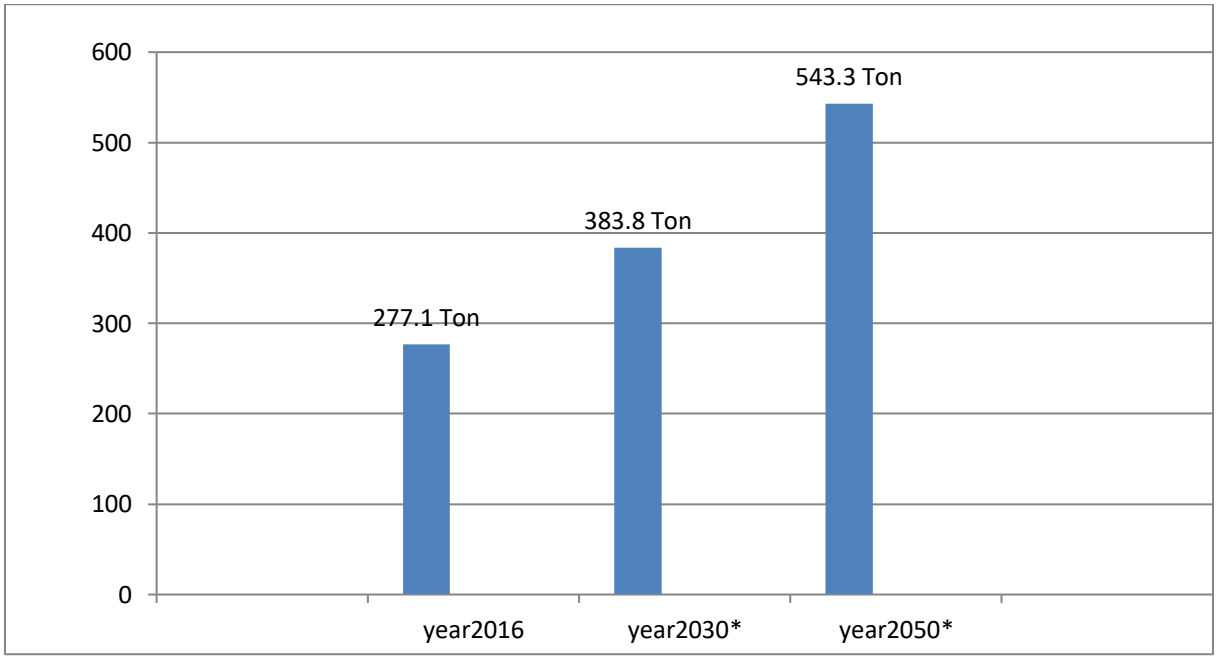
At present Solid waste management is a global issue. Waste management has a direct relation with daily health, social cleanliness and environment, due to which every person in the world is affected by it. The increasing solid waste on the surface and in the oceans is becoming a challenge for human life as well as for other living beings. Increasing urbanization, population growth, unmanaged and improper solid waste disposal have increased the problem of solid waste management. With increasing urbanization and economic development, most of the world's cities are producing more than 1.3 billion tonnes of solid waste and this quantity of solid waste is expected to be around 2.2 billion tonnes by 2025. According to an estimate, up to 50% of this

waste is biodegradable organic matter. This proportion is higher in developing countries. Due to the high amount of waste in the cities of most countries of the world, up to 20-30% of the municipal budget is spent on waste management.

Status Of Urbanization And Solid Waste Generation

Solid waste management has emerged as a challenging issue even in Indian cities. India being a developing country is struggling with the problems faced by developing countries. Increasing population and migration of rural population towards cities, both these problems are directly related to solid waste. Due to rapid urbanization, many types of problems are arising in the management of solid waste. From the research work done in the field of solid waste, it has been concluded that by 2050, India will become the most waste producing country in the world. At present, there is 0.5 kg of waste per person per day in India, but gradually this quantity is increasing and by 2050 it is estimated that 900 grams of waste per person will be generated. The changing lifestyle over time is increasing the amount of waste more and more. In the increasing economic activities in the cities, the generation of toxic waste is also accepted as a normal situation. Waste coming out of industries is dumped in Indian rivers, but the environmental changes caused by this process are considered to be a normal situation.

Figure-1 Volume of Solid Waste Generator In India



Source-https://timesofindia,indiatimes.com/india/in-30-years-india-tipped-t0-double-the-amount-ofwaste-it-generate/articles/74454382.cms

Note-Expected Data

At present, urbanization in India is like a process. The role of sustainable cities has been emphasized in the Sustainable Development Goals (SDGs) for the inclusive security and well-being of cities and human habitats in the development actions set by the United Nations by 2030. Waste generation, is a natural product of urbanization, economic development and population growth, so the rate at which all these variables increase, waste also increases at the same rate.

According to Census 2011, the population of India is 121.01 million, of which 377.10 million (31.16%) is urban and 833.08 million (68.84%) is rural. During the year 2001-2011, the decadal increase in urban population was 90.97 (31.8%) million while the increase in rural population was 12.3%. In India by the year 2030 based on the growth rate of Census 2011the urban population is expected to reach 575 million and reach 875 million by 2050.

Table-1 Decadal Population Growth

Population (in crores)			
Year	Total	Rural	Urban
1991	84.4	62.7	21.7
2001	102.9	74.3	28.6
2011	121.0	83.3	37.7

Source-census2011 https://censusindia.gov.in/

According to the 2011 census, the rate of population growth in Indian cities is 3.35%. In the next 10 to 15 years, about 50% of the population will reside in the cities of India. The increasing population has a direct relation with the solid waste generation, so it will be a challenging task to handle the system of solid waste management in the cities, as well as the management of solid waste in India has become extremely necessary not only from the environmental point of view but also in changing circumstances over the time. 31% of India's urban population generate 1,43,449 metric tonnes of solid waste per day (CPCB 2014-2015) and these figures are increasing day by day.

Table-2 Trend Of Waste Generation In India

Year	Waste generated per capita (g/day)	Total Municipal Waste Generation (MT/yr)
1997	375	14.1
1981	430	25.1

1991	460	43.5
1997	490	48.5
2025*	700	Double of 1997

Source-indiaenergyportal.org **Note-Expected Data**

Using and implementing modern technology for solid waste management becomes very difficult for a developing country like India. Keeping in mind the rapid urbanization and population growth, it is necessary to first understand what are the aspects of solid waste generation , as well as how much solid waste is generated. Correct statistics help the government and local institutions to formulate policies, implement and diagnose problems related to finance. Solid waste management can be made efficient only by association of waste management organization and citizens with all the factors of solid waste.

Solid Waste Management

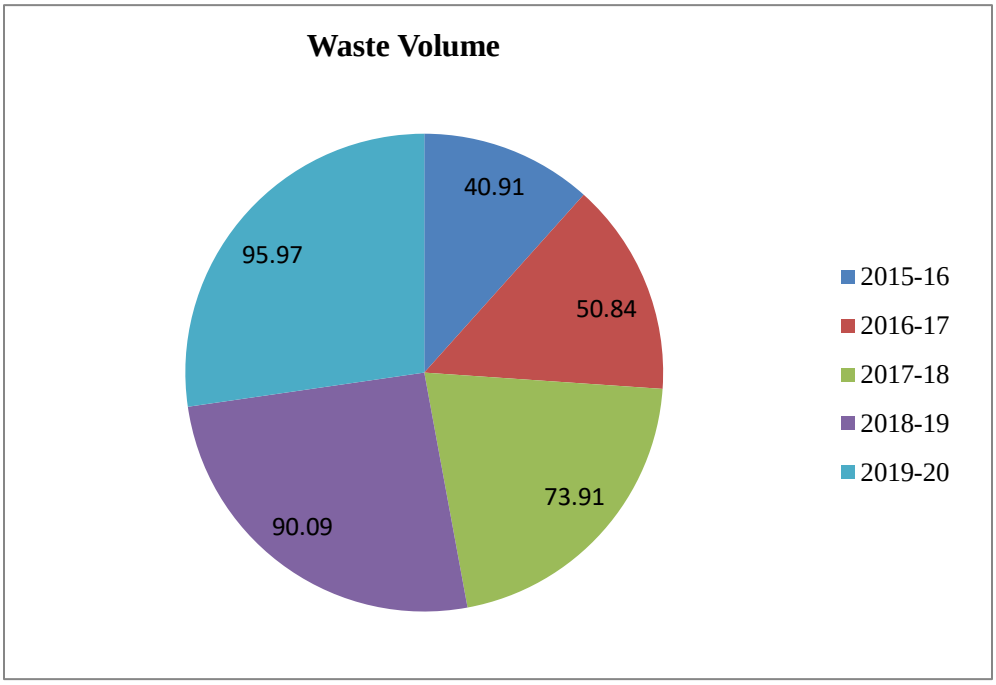
Management of Solid Waste In Indian Cities

Solid waste management in Indian cities is done by local administration and private organizations. There is a continuous increase in the amount of solid waste, there are many reasons behind this increase, such as increasing population in cities, improvement in income and change in consumption trend, etc. But somewhere there is a direct relation between the increasing population in cities and the generation of solid waste.

According to the cleanliness newsletter **(swachhata sandesh newsletter Jan 2020)** of the Ministry of MOHUA, till January 2020, 147,613 metric tonnes of solid waste has been generated per day. The Planning Commission's 2014 report **Task Force on Waste to Energy** estimated that urban India would generate 2,76,342 tonnes per day in 2021, 4,50,132 tonnes per day in 2031 and 11,95,000 tonnes per day by 2050. There is a possibility According to Ministry of MOHUA **door to door** waste collection in India was 40.91% in 2015-16 which has increased to 95.97% in 2019-20.

It is clear from the below data that there is a lot of difference between solid waste collection and waste treatment. Remaining about 40% of the remaining waste is thrown in the open space, due to which the public has to face many problems, as well as the indifferent attitude of the citizens towards waste management, further increases the difficulties of the local administration.

Figure-2 Percentage Of 100% Door To Door Waste Collection

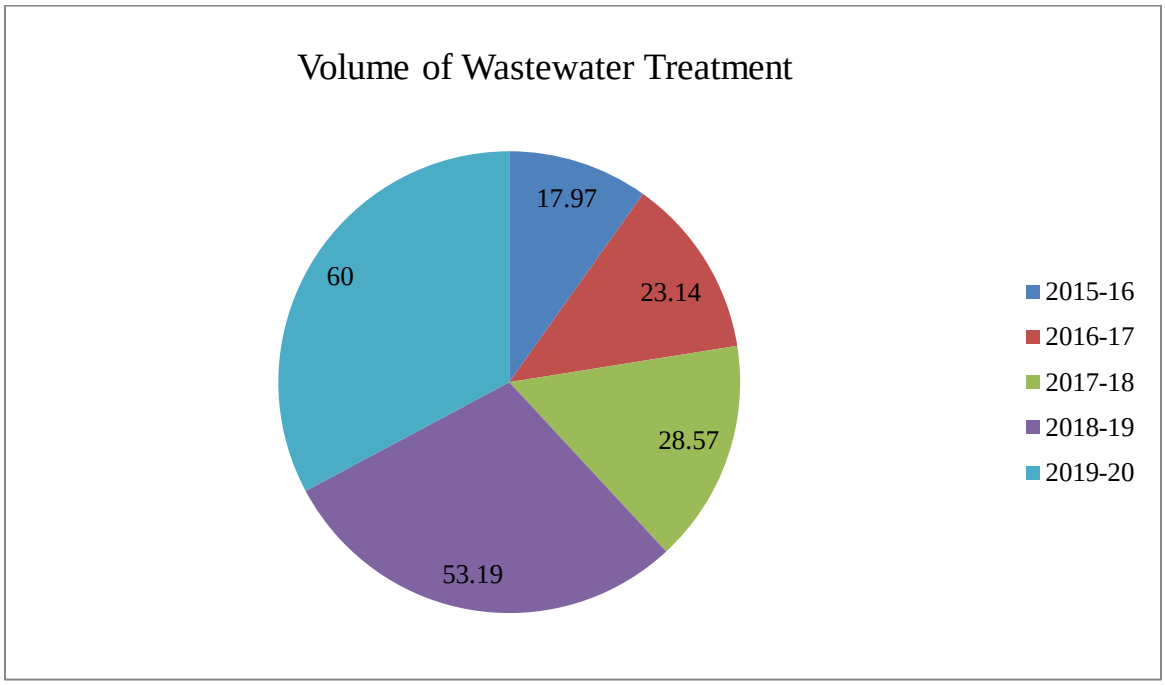


Source-Ministry of Housing and Urban Affairs http://mohua.gov.in

Waste collection is increasing every year under solid waste management, but waste treatment is done in very less quantity. In 2015-16 only 17.97% of the total waste could be treated and this quantity has increased to 60% in 2019-20. The rest of the waste is thrown in the open space. In India solid waste is mainly organic waste, whereas in foreign countries, the amount of packaged waste is more. Therefore, the main challenge of the Indian urban administration is regarding the

segregation of waste containing moisture. As per the policies of the government, efforts are being made to make door to door segregation possible so that solid waste management can be made efficient at the initial stage itself.

Figure-3 Percentage of Waste Treatment



Source-Ministry of Housing and Urban Affairs http://mohua.gov.in

Now The Question Arises That Why Solid Waste Should Be Managed?

Solid waste management is directly related to human health, environment and economic activities. Out of human diseases, about 22 diseases are directly related to the mismanagement of waste. India ranks 168 out of 180 countries in the Environmental Performance Index (EPI) 2020. This situation of India is very worrying. EPI is calculated on the basis of 11 different issues and 32 performance indicators. Waste management is one of these 11 issues with a share of 2%. India's performance is very poor in air quality, sanitation and drinking water and waste management. If somewhere solid waste is dumped in such an open place, it has a bad effect on water, soil, air and people living nearby. There is a lack of waste-related industries in India due to considering waste only as a useless item. There are many industries that depend on waste, such as: recycling, composting, making bricks from construction concrete and producing biogas, etc. Although at present some startups in India have started working in this field, but this effort is negligible considering the amount of waste. With the increasing population in the cities it is

necessary to create a proper environment and hence it becomes necessary to manage the solid waste and this will also help India to achieve the SDG targets.

Growing Amount of Solid Waste in India

The amount of waste generation depends on the standard of living of people, various types of business activities, changing eating habits, geographical and environmental changes and migration of people from villages to cities etc. According to the MNRE report, by the year 2047, India is likely to generate 260 metric tonnes to 300 metric tonnes of waste per day.

Table-3 Growing Amount of Solid Waste (Ton/Day) in Indian Major Cities

City	Population 2011	Waste Generation)TPD)		
		2004-05	2010-2011	2015-2016
Mumbai	12,442,373	5320	6500	11,000
Delhi	11,034,555	5922	6800	8700
Bengaluru	8,443,675	1669	3700	3700
Chennai	7,088,000	3036	4500	5000
Ahmedabad	5,577,940	1302	2300	2500
Kolkata	4,496,694	2653	3670	4000
Jaypur	3,046,163	904	310	1000
Lucknow	2,817,105	475	1200	1200
Kanpur	2,765,348	1100	1600	1500
Visakhapatnam	2,035,922	584	334	350
Indore	1,960,631	557	720	850
Bhopal	1,798,218	574	350	700
Patna	1,683,200	511	220	450
Coimbatore	1,601,438	530	700	850
Varansi	1,201,815	425	450	500

Srinagar	1,192,792	428	550	550

Source-CPCB 2018b https://cpcb.nic.in

It is clear from the statistics that in almost every city, there has been more than 100% increase in waste generation and in some cities this increase is more than 200%. Data of many cities is also not available due to which many problems have to be faced in making policies. According to an estimate, by 2051, an area of up to 1400 sq km will be required for landfill. Many research studies done in the past believe that 40% to 50% of the waste generated is organic and 30% of the waste is recyclable.

Challenges Arising Out Of Mismanagement Of Solid Waste In India

- **Environmental And Health Problems**

  Human health is directly related to waste management. Employees working in the waste management sector lack equipment to protect against waste contamination such as gloves, uniforms and safety equipment, etc. Due to this, employees often have to face skin and respiratory related diseases. The waste lying in the open and the liquid called leachate coming out of the landfill contaminates the water and soil and gives rise to serious human diseases.

- **Non-Compliance Of Policies Related To Solid Waste Management**

  Failure to follow the rules under SWM rules 2016 at the national level is responsible for the mismanagement of waste. Using the land without planning and not following the rules made in the Swachh Bharat Mission related to solid waste management is responsible for this problem.

- **Constraints In The Modernization Process Of Solid Waste Management**

  Most of the Indian cities do not follow all the steps of solid waste management. The waste is collected and dumped directly into the landfill without going through the separation and recycling process. Such landfills are visible in most of the Indian cities. There is a lack of modern equipment used for waste management. Non-composting of organic waste and lack of recycling plant further increases this problem.

- **Indifference Of Citizens Towards Solid Waste Management**

  There is a lack of awareness among the citizens about solid waste management. Throwing waste in open areas, non-segregation of waste and excessive use of plastic, etc. are the reasons which prove this fact.

- **Lack Of Knowledge About Industries Related To Waste Management**

  There is a lack of waste-related industries in India due to considering waste as a useless commodity. There are many industries that depend on waste, such as plastic and metal recycling, composting, making bricks from construction concrete, making biogas, etc. Although at present some startups in India have started working in this field, but this effort is negligible considering the amount of waste.

Conclusion

Due to the changing environment and urbanization, in the current situation of India, efficient operation of solid waste management has become the need of the time. Due to the increasing population and positive relations in solid waste management, it is necessary for a developing country like India to manage waste, so for solid waste management, the private sector should be promoted along with the government sector, due to which the new business sector should also be developed. Positive steps can be taken in this direction by increasing the awareness of citizens and local administration towards solid waste management. In very few metro cities of India, the work of solid waste management is being done in a modern way, so the work of waste management can be conducted efficiently by using modern techniques in the field of solid waste management. Efforts should be made to develop waste as a resource by making capital investment for solid waste management, so that proper environment can be created for the increasing population in the cities in the coming times and this will help in achieving the goals of sustainable development.

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