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An Examine on the Solid Waste Management System in Urban India and Its Impact on Climate Change

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ABSTRACT: Most cities are finding it difficult and only to cope with the existing situation but also to anticipate future trends and prepare and plan for this no or unreliable waste assemblage upshot in waste cumulation in neighborhoods and imperil citizen health . Deficient treatment or disposal severely pollutes the environment and contributes to global warning . Solid waste management system in India has emerged as a hurdle in the development of Urban India , there is lack of management system . Each state have taken a step to move towards waste segregation , door to door waste collection , adopting circular economy . reuse , recycle and repair of products and waste management . Indore has set the example for other states to make the state complete garbage free and processing of waste . Clean city also been an scheme adopted by the government to manage garbage waste and other solid waste , a reduction in textile , food waste by adopting eco -friendly means and organic methods . The low income countries and the developing countries produces maximum amount of waste due to rapid urbanization , over population and industrialization .

KEYWORDS : Waste collection , waste segregation , urbanization , over population , solid waste management

I. INTRODUCTION

Solid waste management has emerged as a serious problem in today's world which has affected our environment . Improve disposal of waste has resulted in environment hazard , given birth to many diseases and made the land unproductive , there are many kind of waste food waste , e-waste , water waste , textile waste which has an impact on the humans and environment .The developing countries produce more waste compared to developed countries because of the huge population , now it differs low income countries produces low waste and high income countries produces more waste , depending on the kind of waste . Organic fraction is significantly high in low income countries than the organic waste in high income countries . On the other hand packaging waste , paper and plastic in high income countries is much higher compared to other low income countries . Waste composition varies depending on the location , domestic waste , the use of gas for cooking will produce different amount of waste compared to the food cooked using coal . Waste management has emerged as an important element to tackle environment degradation and climate change at the same time . The world is shifting towards Circular economy and adopting to reuse or recycle of a product to reduce the amount of waste generated . Proper solid waste management system is of utmost important to the world today to tackle climate change . We also require good transportation for collecting waste from the landfills , today most of the waste is treated and recycled , plastic waste contributes to the maximum amount , across the world . Plastic waste equates quite strongly in raising the calorific value while the moisture content , water content influence the course will negatively influence the calorific value . For instance in low income countries we have 6% paper , 2 % textile and 53% bio waste which would be the sum of wooden leaves and food waste, then we compute 90 times the 7 % plastic minus 46 times 60% moisture content of such waste . Waste collection cost is strongly influenced by choices in equipment by times inefficiencies like the idle time of this truck waiting for ages to be loaded with waste , the world generate 2.01 billion tonnes of solid waste every year , waste generated per person is 0.74 Kg .It is estimated that it will increase by 3.40 Billion by 2050. 13.5% of the waste generated is recycled and rest 5.5 % is composted . 40 % of the waste across



different countries are dumped or openly burned which are not managed properly . Global waste production contributes to 5% of global emissions in 2016 and the outcome is 1.6 billion metric tons of carbon dioxide equivalent , food waste amounts to 47 % , under development waste management infrastructure , the open dump sites in the poor countries has given rise in multiple environment hazards and diseases which has also affected the climate also for instance in India .

II. RESEARCH METHODOLOGY

For the purpose of this exploration , I have used a amalgamation of two of the archetypical social sciences research tools application –as they are authentic and brilliant method to assemble statistics from multiple appellants in an methodical and convenient way . Question were asked to the common youth , public policy Analyst , urban people , slum dwellers , survey , interviews –consisting of several interrogation which were dispersed among representative of each contender group .

Objective of the Research Paper

The main areas of exploration in this paper incorporates

1. Why solid waste management has emerged as a threat to the world.
2. What is the situation in India when it comes to solid waste management.
3. What initiative have the government take both state and central to manage waste management in India .
4. What can be the way forward of waste management system in India .

III. LITERATURE REVIEW

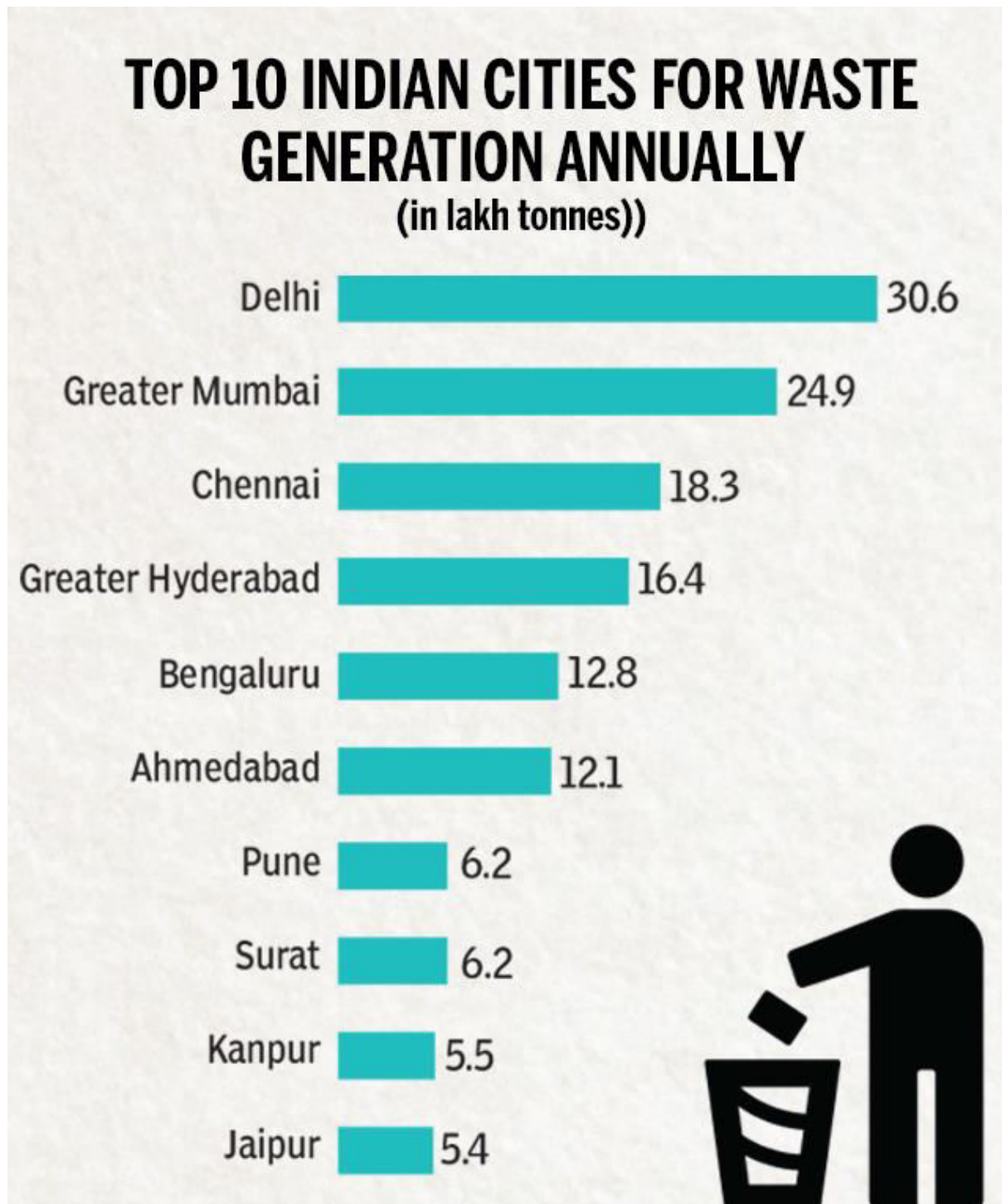
In India solid waste management has emerged as a threat to urban development , it is the responsibility of the Urban Local bodies to take in charge of proper waste management , Municipal waste is roughly classified into five categories Recyclable material (glasses , bottles , paper , metal , cans , certain plastic etc) , composite wastes like tetra , packs and toys , Biodegradable waste (like Kitchen waste and green waste such as flowers , fruits , leaves and vegetables) , Inert waste (rocks , construction material , debris) and domestic hazardous and toxic waste like e-waste , medication , lights bulbs , fluorescent tubes , shoe polish .With rapid urbanization , industrialization and overpopulation in India , solid waste management has become a challenge for the state government and the local bodies , The Swachh Bharat Abiyan was created to tackle these very issue related to waste management cleanliness and sanitation on a national level , Solid waste management is one of the basic essential services provided by municipal authorities in the country to keep urban centers clean , however , municipal laws governing the urban local bodies do not have adequate provisions to deal effectively with the ever growing problem of solid waste management , it is among the most poorly rendered services , the systems applied here are unscientific , outdated and inadequate , the population coverage is low and the poor are marginalized , waste is littered all over the country leading to insanitary living conditions . Hyper consumption is a problem in modern times , Human generates humongous amount of waste , a massive amount of which is disposed in landfills and through waste to energy incinerators , however , billions of tonnes of garbage , including micro plastics never enter the landfills or incineration and ends up in the oceans , this garbage chokes marine life and disturb zooplankton which are vital for the eradication of carbon dioxide from the atmosphere . The methods adopted for waste management in India is Landfill which if design carefully , can serve as economical and quite sanitized method for waste dumping ,Incineration , it is a controlled high temperature oxidation of primarily organic compounds that produces thermal energy , carbon dioxide and water , useful to deal with large quantities of organic hazardous waste and produces electricity other thermal methods include Pyrolysis it is a process by which solid is converted into liquid and liquid into gas which is used for the production of energy , Gasification , this material is directly treated to SynGas(Synthetic Gas) which has hydrogen and carbon dioxide as its component , then we have Bioremediation which involves the use of living organisms , primarily micro-organisms to degrade environmental contaminants into less toxic forms for instance Pseudonymous bacterium can decompose synthetic pesticide ,bioremediation techniques are more economical than traditional methods and pollutants can be treated on site , reducing exposure risks for personnel to treat solid waste management.



IV. FINDINGS



India produces 227.1 million tonnes of solid waste every year which is likely to touch 387.8 million tonnes in 2030 and 543.3 million by 2050 because of rapid urbanization , rise in the population followed by economic growth , India produces the maximum solid waste in the world , Bermuda and US are the top country when it comes to per person generation of waste every year , while Bermuda generates 4.54 kg of waste per person , US produces 2.24 kg and India 0.74 per person , by 2050 , it is estimated to increase by 900 gm every day , on a daily basis the country produces more than 1.50 Lakh MT of solid waste of the total collected waste only 20 % is processed and the remaining 80 % is dumped in landfill sites , Urban areas alone generates 1,70 ,000 tonnes of waste per day . There is also a significant disparity in the waste generated per person/ day between small towns and cities , while people in small towns could stack up about 0.17 kg per person and their counterpart cities generates about 0.62 per person .The growth of urban population is resulting in the escalation of waste generation , as per 2020, 147,613 MT of waste is generate per day . Maharashtra produces the maximum amount of waste per day that is 22,080 MT ,the lowest is produced by Sikkim that is 89 MT per day , Delhi produces the maximum amount that is 10,500 MT when it comes to 10,500 MT per day and Daman & Diu the lowest per day . The biodegradable waste amounts to 52% , non-biodegradable waste amounts to 32 % and recyclable waste amount to 17 % in India , however this many vary from one year to another . The increasing use of plastic waste in India is a measure problem , 26,000 tonnes of plastic



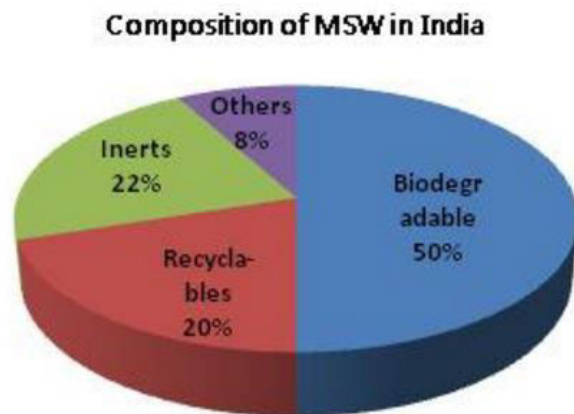
waste is generated per year in India which is 9.4 million per day .

Waste collection and transport is an important element for solid waste management where 75 to 80 % of the waste is collected and 28 % of that is processed and treated . When large amount of waste is dumped which results in clogging of drainage and effects the sewerage systems which give rise to a number of diseases and insects . As of January 2020 , Ahmedabad has the highest garbage collection that is 95 % and the lowest is in Delhi that is 39 % .

The informal sector of the country plays a significant role in waste management which here most of the time not recognized and the lack of protection and legal status given , in fact there collect 10,000 tonnes of reusable waste every



day with taking proper protection measures , at present there is no recognition of their work , Waste segregation has become mandatory where there are separate green and blue color bins for the disposal of wet and dry waste blue bins are for dry waste and green is for wet waste so that there can be proper recycling and recovery of it , this can help to reduce the work of the solid waste management on the Urban Local bodies . Usually wet waste is composed . Tamil Nadu has achieved 100 % waste segregation in 20 small municipalities , as per 2020 Chhattisgarh and Kerala all the household have adopted the practice of waste segregation , Daman and Diu has also achieved 100 % waste segregation . As per Swachhata Dandesh Newsletter 81,135 wards across different states in India have achieved 100 % door to door waste collection , in states like Goa, Gujarat , Andhra Pradesh , Karnataka , Madhya Pradesh , Rajasthan , Mizoram , Uttarakhand , Chattisgarh and Arunachal Pradesh . The Union Territories have achieved 100 % door to door collection system , when it comes to cities then Mysore is the at the top followed by Chennai and Mumbai which has achieved 80 % .On the other hand Chattisgarh processes the highest amount of waste that is 90 % and the lowest is in Meghalaya that is 4 % India also produces the maximum amount of food waste in the world around 68,000 tonnes of food waste happens in India per year ,As per 2019 , Madhya Pradesh is the first state to have managed 100 % trash collection and solid waste management and door to door collection .Today Indore has become a garbage free and the cleanest city in India by 100 % processing



The transportation of solid waste is still a problem in India which many cities lack the primary vehicles are mini truck with hydraulic , tricycle with containers it depends upon the distance and quantity of waste . Now the Urban Local Bodies have installed Global Positioning system , Global system for Mobile Communication and Global geographic Information system to collect waste from secondary sources .

In India nearly 50 % of the household waste is wet organic waste with low calorific value , Landfills are seedbeds of methane and other greenhouses gases , which contributes to global warning followed by these toxic chemicals poison the soil and their leached run-off makes its way into the oceans and while they do generate energy , waste incineration causes health issues such as cancer , this makes options such as waste to energy incineration inefficient .



Way Forward

Urban solid waste management is emerging as a threat for urban development , rapid urbanization and unplanned construction with excess disposal of waste into the oceans , landfill is resulting in environmental Hazard and giving rise to diseases , clogging the drains and sewage system , We need to provide waste segregation and door to door collection of waste in every household in all sectors of the society including the urban slums areas which has become a locality of disposal of waste , We need to reduce domestic waste . Every lane should have a green and blue color bin , and complete ban on the disposal of any kind of waste on the road , we need to start charging people who throw waste on the road or any kind of garbage , plastic , rapper on the road , the focus should be to keep all the cities clean , with use of technology we can keep our city clean with smart solid waste management system with the use of artificial intelligences. 100 % processing should be made compulsory in each and every state and district , we should focus on reuse , recycle and reproduce systems and adopting more circular economy , Courses at the school and college level should be started with separate certification on waste management and every kind of waste management should be initiated , waste management system should be initiated among the youths from the school levels, by making them maintain the school clean , volunteers should take the initiative and work towards clean city and management of solid waste at every corner of the society .The Focus should be on refuse , reduce , reuse , repair and recycle with complete ban on the use of plastic bags

V. CONCLUSION

Cities like Indore , Surat , Ahmendabad , Mysore , Ambikapur set examples for the rest of the India how to managed waste . The government should bring in new schemes for solid waste management , ban on the use of plastic waste , sustainable way of living should be adopted in every sector with green initiatives , green economy to green buildings which can help to reduce solid waste to a greater extent , Organic farming should be brought more into the picture that can minimize agricultural waste , textile waste also needs to be reduced by adopting eco friendly ways . All the waste



that we produce should be segregated in a proper manner so that we can recycle them and use it for the manufacture of other products , we have many instance of plastic bottles are today being used in the craft sector and making of new clothes and in fact roads .

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