A Review on Waste Management

Kanika Rastogi, Akash Diwakar, Kshitij Shinghal, Aastha Gupta, Akshay Goyal

B.Tech Student (4th year), Department of Electronics And Communication Engineering, Moradabad Institute of Technology, Moradabad, Uttar Pradesh, India

B.Tech Student (4th year), Department of Electronics And Communication Engineering, Moradabad Institute of Technology, Moradabad, Uttar Pradesh, India

Associate Professor & H.O.D, Department of Electronics And Communication Engineering, Moradabad Institute of Technology, Moradabad, Uttar Pradesh, India

B.Tech Student (4th year), Department of Electronics And Communication Engineering, Moradabad Institute of Technology, Moradabad, Uttar Pradesh, India

B.Tech Student (4th year), Department of Electronics And Communication Engineering, Moradabad Institute of Technology, Moradabad, Uttar Pradesh, India

ABSTRACT: Due to the ever increasing population, the amount of waste is increasing day by day and it is getting unmanageable which is leading to inefficiency in waste management system and unsanitary living conditions. So to properly monitor the status of the waste bins kept on the roads or at homes, to avoid overflowing of the bins and littering of the garbage on the roads, an idea has been proposed sensing the level of the bins and updates their real time status with their location on the online webpage making the waste collection and transportation system more efficient.

KEYWORDS: Solid Waste, Electronic Waste, Hazardous Waste.

I. INTRODUCTION

Population of India is increasing at a very high pace in last few years, the growth rate of India's population is highest in the world and it is the second largest economy of the world due to which it demands a high rate of industrial activities. Due to the increase in the industrialization, a large population of India which resides in rural areas is now migrating from rural areas to urban areas. Due to the continuous increase in the population, rapid increase in the number industries and the migration of people from rural to urban areas, the waste generated in the cities is increasing significantly, which results in many environmental related issues, health problems to the people and the climatic imbalance.

This is a major issue which needs to be concerned at various levels. A large number of policies have been launched by the Indian Government regarding this issue but there is no proper system which maintains the record of every day work regarding management of waste. A quality result could not be achieved at individual basis; this problem demands a collective effort of the Government and public with the utilization of technology.

On an average India generates around 0.2 to 0.3 million tons of waste every day. According to a survey the maximum waste is generated by the metropolitan and big cities. Big cities like Bangalore generates around 3500-4000 tones of waste and Mumbai and Delhi generates almost double of it (i.e., 7000 tones per day). Out of the waste gathered only 70-80% of municipal waste is collected while the remaining is dumped on to streets or open ditches. Fig.1 shows share of different states and union territories in the solid waste generated by the urban areas and fig. 2 shows share according to the class of city. According to fig. 1 maximum waste is generated by the Maharashtra and according to fig. 2 maximum waste is generated by metropolitan cities.
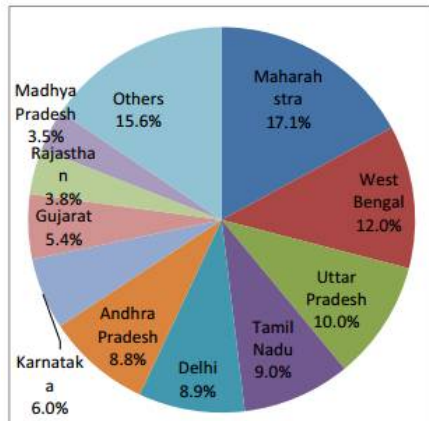
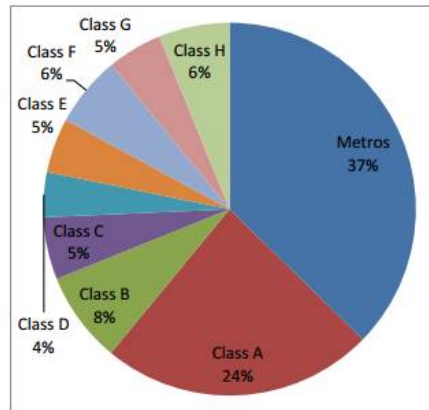**Fig.1** Share of states and Union Territories in urban MSW generated

Fig.2 Share of different classes of cities in urban MSW generated

Now-a-days electronics technologies are growing due to which another type of waste is also added in the categories of waste i.e., Electronic Waste. Electronic waste is popularly known as E-Waste which can defined as electronic equipment or product with power plug or batteries which become obsolete due to advancement in technology, life style and status. Electronic waste is one of the most hazardous problem to the environment. According to survey at present Bangalore alone generates about 8000 tones of computer waste generated annually.

The problem in the present scenario is that sometimes the bins are full and the garbage vans don't pick up the garbage due to which garbage bins overflows and litter on the road and sometimes when a garbage when reaches to pick up the garbage the garbage bins are empty this causes the wastage of fuel of the van.

II. ORGANISATION

Rest of the paper is organised as follows: Section III describes the about the related work in the solid waste management. Section IV describes the challenges for solid waste management. Section V tells about the probable solution that can be done to avoid mismanagement of waste. Section VI in this section we concluded about the whole paper

III. RELATED WORK

The status of solid waste management is considered as a development indicator as it has direct link to issues like sanitation and public health. Thus, management of solid waste generated in a country has been one of the priorities while forming policies at national level. However, the situation of solid waste has always been questionable. The major reasons being, are economic growth, migration from cities, unplanned land use, the lack of proper legislations on solid waste management and most importantly, the lack of proper awareness among the people and the improper monitoring system.

The major landmarks which were made in the history of solid waste management are[1]:

Year	Rules/ Policies/ Schemes/ Plans
1989	The Hazardous Waste (Management & Handing) Rules
1994-95	MSW Management- Strategy paper by NEERI
1998	Bio-medical Waste Handling Rules,1998
2000	MSW (Management & Handling Rules), 2000
2005	Report of the Technology Advisory Group on Solid Waste Management 2005
2006	Strategy and action plan-use of compost in cities
2008	National Urban Sanitation Policy
2009	Draft document on e-waste Handling Rules
2010	National Mission on Sustainable Habitat

2011	Plastic Waste Rules, 2011, & E-waste Rules, 2011
2013	Draft Municipal Solid Waste Rules 2013
2014	Draft Manual on Municipal Solid Waste Management and Handling
2014	Swachh Bharat Mission
2015	Atal Mission for Rejuvenation and Urban Transformation

IV. IMPACTS AND CHALLENGES

Modernisation and progress has its bad impacts too at the same time in the form of pollution and other environmental problems too. As the global population is increasing there is a increase in the demand of the food and other essential things, but there has been a rise in the amount of the waste generated daily by each household activity. Somewhere there is a flaw in our system and the waste is not collected properly and even not disposed properly. The waste that is not treated properly, solid waste generated from households or communities leads to many infectious diseases. Unattended waste lying around attracts flies, rats which in turn cause diseases.

Although, many such plans, policies and schemes have been done but the desired outcome is still not the same as the actual one. Also, GPS system has been installed in each of the garbage picking vehicle but that can only monitor the route of the vehicle not that particular area which needs a major attention for picking the garbage at that particular time. Though there have been many barriers for achieving the desired outcome but the major ones are unavailability of database on waste streams generated-quantity and composition and lack of proper monitoring and inspection techniques. Instead of so many schemes what we see is that the bins are overflowing and the waste has been littering on the road resulting in number of problems to the nation.

There is no full proof system in India which can assure that waste is treated properly. Even there is no system which can make a efficient account or collect data about the waste management in any locality. Till now we are using survey method, directly contacting to people etc, all this method requires a lot of human efforts, efficiency is very less and time requirement is very large. So it is the urge of the society that there should be a system which can maintain the data record without any human effort and it should also be able to record the exact problem of the mankind.

V. PROBABLE SOLUTION

For providing the efficiency in the solid waste management system we need to move towards the automation in the following respects:
1. By providing a robotic arm in the dustbins which could pick up the waste littered on the ground around the bins.
2. A technology which could detect the E-Waste and scrap it out from the dustbin as it radiates a harmful radiation which becomes hazardous for the humankind.
3.   A sensing technology which could sense the level of the waste in the bins and trigger the concerned authority regarding it so that they can take an action at that very moment.
4. At present these technologies may seem to be hypothetic or futuristic but as human is moving towards the automation day by day this can also be achieved.

VI. FUTURE WORK

Collection of waste is generally divided into two categories: primary collection and secondary collection. The collection of waste from the source like houses, commercial establishments, markets and so on is primary collection. When waste is collected from storage places like bins and finally transported to processing units or disposal sites it is termed as secondary collection.

Also as mentioned, out of the total waste generated in India only 70% waste is collected. The remaining waste remains in the streets which create unsanitary living conditions. The intervention in the collection system should be called for this.

So, there is a need of smart way of managing waste. The major problem with waste management system in India is its lack of efficiency of waste collection and transportation system.

A solution with a combination of hardware and software has been proposed through which the collection system in India could be improvised in which the quantity of the waste collected can be regularly monitored which will

eventually help in knowing the routes in which vehicle is to be send, furthermore in saving the fuel of the vehicle and identification of critical areas which, probably, need special attention.

Integrating the waste management system with the information technology can have a huge impact on the condition of the waste sector in India. In this, the real time state of all the bins will be displayed on the online web services. The sensors will constantly record the data of amount of waste collected at various locations and create a database which will be easier in understanding, analysing and predicting the waste production patterns, and eventually manage waste more efficiently

VII. CONCLUSION

With the increasing population, the amount of waste is increasing day by day which is not properly manageable. The status of the bins is not properly monitored and the waste is over flown and littered on the roads leading to unsanitary living conditions. Instead of so many plans and policies already being made and many technologies already being implemented there has not been a better outcome coming out.

Hence improving the conditions of managing the waste is imperative. There is a high need to look after this major problem in India and to make it a much better place.

So, to initiate with a small prototype of properly collecting and monitoring the amount of garbage collected in the bins can be implemented, which through the sensing technology will determine the real time status of the bins to the concerned person in the municipal authority. So, that a vehicle can be sent at that particular time to collect the garbage which will further result in saving the fuel of the vehicle.

VIII. ACKNOWLEDGEMENT

REFRENCES

[1] Sunil Pandey, Shri Prakash, Jai Kishan Malik "Industrial And Urban Waste Management in India".

[2] Ranjith Kharvel Annepu, Nickolas J. Themelis, Stanley Thompson "Sustainable Solid Waste Management in India", Columbia University in the City of New York, January 10, 2012.

[3] "E-Waste in India", Research Unit (Larrdis), Rajya Sabha, Secretariat, New Delhi, June 2011.

[4] Sonam Sahu, Dr. Sindhu J. Nair, Pankaj Kumar Sharma, "Review On Solid Waste Management Practice in India: A State of Art", International Journal of Innovative Research And Development, Volume 3 Issue 3 March 2014.

[5] Jaiswal, A., & Bharat, A. Accessing Institutional And Regulatory Framework for "Solid Waste Management in India", International Journal of Regulation And Governance, in 2013.

[6] "Municipal Solid Waste Management: Treatment Process And Prospects of Public Private Partnership". Gol, in JNNURN in 2011.

[7] "Status of Municipal Solid Waste Management" in CPCB in 2012.

[8] Kumar Sunil "Municipal Solid Waste Management in India: Present Practices And Future Challenge Clean Development Mechanism in United Nations Framework Convention on Climate Change".

[9] Kanchan Mahajan, Prof. J.S Chitode "Waste Bin Monitoring System Using Integrated Technologies" International Journal of Innovative Research in Science Engineering and Technology Volume 3, Issue 7, July 2014.

[10] Municipal Solid Waste Management Manual, Central Public Health & Environmental Engineering Organisation (CPHEEO) in collaboration with German International Cooperation, May 2014.

[11] Vijay Kumar, Dr R.K.Pandit "Problems of Solid Waste Management in Indian Cities" International Journal of Scientific and Research Publications, Volume 3, Issue 3, March 2013.

[12] T.V. Ramachandra, Shruthi Bachamanda "Environmental Audit of Municipal Solid Waste Management" Int. J. Environmental Technology and Management, Vol. 7, Nos. 3/4, 2007.

BIOGRAPHY

Kanika Rastogi was born in Moradabad, and done her schooling from St. Marys Senior Secondary school, Moradabad, Uttar Pradesh, India. Presently she is pursuing B.Tech from Moradabad Institute of Technology, Moradabad, India and her branch is Electronics and Communication Engineering.

Akash Diwakar was born in Moradabad, and done his schooling from Moradabad Inter College Moradabad, Uttar Pradesh, India. Presently he is pursuing B.Tech from Moradabad Institute of Technology, Moradabad, India and his branch is Electronics and Communication Engineering.

Kshitij Shinghal was born in Moradabad, and he has completed his B.tech (E.C.) from Shivaji University in 1999 and M.tech (E.C.) from U.P. Technical University (U.P.T.U.) Lucknow in 2006. He has completed his Ph.D. from research center CDAC Noida in affiliation with Shobhit University, Meerut in 2013. At present he is working as Associate Professor & Head of the E.C. department, Moradabad Institute of Technology, Moradabad.

Aastha Gupta was born in Moradabad, and done her schooling from K.C.M Senior Secondary School, Moradabad, Uttar Pradesh, India. Presently she is pursuing B.Tech from Moradabad Institute of Technology, Moradabad, India and her branch is Electronics and Communication Engineering.

Akshay Goyal was born in Bijnor, and done his schooling from Modern Era Public School Bijnor, Uttar Pradesh, India. Presently he is pursuing B.Tech from Moradabad Institute of Technology, Moradabad, India and his branch is Electronics and Communication Engineering.