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A Review Paper Solid Waste Management in Wani

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Abstract

Solid Waste Management is a worldwide phenomenon and a big challenge all over the world for human beings. The problem of solid waste management (SWM) is also prevailing in the Wani city. Therefore the present study is undertaken to find out the problems and prospects of Municipal Solid Waste in Wani city. The detailed investigation was made regarding the methods of practices associated with sources, quantity generated, collection, transportation, storage, treatment and disposal of Municipal Solid Waste in wani city. The data concerning to SWM is obtained from authentic record of municipal council, interacting with people and through questionnaire and individual field visits. This study reveals the present system of MSWM in Wani city. There is improved situation in management post SWM rules 2016,segregation at source though have long way to go, storage and secondary segregation at municipal designated plant has been successfully carried out. The composting units have been created at the Bhalar road plant which reduces the burden of landills and dumping sites.

Keywords: *Municipal Solid waste, Wani Municipal Council, Waste Sources, Dumping Sites*

INTRODUCTION

Waste management involves the collection, transportation, processing, recycling or disposal and monitoring of waste materials. It relates to refused materials produced by human activity, and is generally undertaken to reduce their effect on health, environment or aesthetics.

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Waste management is also carried out to recover resources from it The primary sources of municipal solid waste includes waste generated in domestic, institutional, commercial activities, garden and municipal services. The domestic wastes are high in quantities and vary with time and season. It is generally comprised of organic and inorganic constituents. Now a day the quantity of organic waste is decreasing and the quality of metals, paper and plastics is increasing, indicating that there is growing preference for consumption of packaged food in recent years in modern society. (B.L.Chavan, N.S. Zambare, 2013).

Solid waste management (SWM) has emerged as one of the most massive development challenges in urban India. Numerous studies indicate that the unsafe disposal of waste generates dangerous gases and leachates, due to microbial decomposition, climate conditions, refuse characteristics and land-filling operations. According to the 12th Schedule of the 74th Constitution Amendment Act of 1992, urban local bodies (ULBs) are responsible for keeping cities and towns clean.(Satpal Singh, 2020).

The process of collection, transport, disposal, recycling and monitoring of wastes is called as waste management. Waste management can be costly so it is important to understand the various effective, sustainable and safe means of its management. The three R`s "reduce, reuse, and recycle have become the basic tenet in waste management due increase in generation of wastes, increase in processing costs and decrease in available landfill space (Muzaffar Ahmad BhatBarkatullah, A. WaniAdilSagar,Bhat Mohammad Sikander ,Yaqoob Lone Sagar,Junaid Ahmad.Malik, 2021).

Municipal solid waste management (MSWM), a critical element towards sustainable metropolitan development, comprises segregation, storage, collection, relocation, carry-age, processing, and disposal of solid waste to minimize its adverse impact on environment. Unmanaged MSW becomes a factor for propagation of innumerable ailments (Rajkumar Joshi1 and Sirajuddin Ahmed, 2016) generally; the state and municipal governments consider solid waste a low priority and consequently give less budgetary support to this field. Slow decision-making processes in the municipalities create an additional hindrance. In a broader sense, municipal solid-waste management is a very complex task, as the social,

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economic and cultural cooperation among households, communities, enterprises, and the municipal authorities is minimal and lack of awareness of the rules and regulations, as well as environmental concerns with poor resources, have created a chaotic situation14,15,16. Although India has formulated legislation relating to municipal solid waste, hazardous waste and biomedical waste, the compliance, and awareness of rules among communities and municipalities are lagging behind (Raj kumar Joshi1 and Sirajuddin Ahmed, 2016).

Every year, billions of tons of solid wastes are discarded into our environment as by-products during industrial, mining, municipal, agricultural and other processes. Infrastructure development is not in a position to keep pace with population growth owing to the poor financial health of most of the urban local bodies. Solid waste management services suffer the most in such a situation. Due to Lack of scientific advancement, financial resources, institutional weakness, improper selection of technology and public apathy to solid waste management has made this service inconsistent and far from satisfactory (Vikas Sharma, Amit Sharma, Kunal Singh Sindal, 2017).

Review on Solid Waste Management

It considers waste management in terms of vermin composting as an approach in agriculture. In this project the waste management is undertaken to recycle the wastes so as to reduce the ill effects of wastes on environment, health, and aesthetics. There are several kinds of wastes produced such as agricultural wastes, municipal wastes, industrial waste, mining waste. Some wastes are more hazardous such as medical wastes and nuclear wastes. Various techniques are used for the management of wastes which includes land filling, incineration, anaerobic digestion, pyrolysis, plasma gasification, recycling, composting.

Anaerobic digestion produces biofuel in the form of biogas. Plasma gasification results in the generation of electricity from wastes. Recycling of wastes involves the collection, sorting, and reprocessing of wastes into new products. Vermi composting is the preferred form of composting as it results in the formation of vermin compost called black gold due to the presence of rich nutrients and growth promoting factors in it space (Muzaffar Ahmad Bhat Barkatullah, A. Wani AdilSagar, Bhat Mohammad Sikander , Yaqoob Lone Sagar, Junaid Ahmad. Malik, 2021).

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The present study is a comprehensive review summarizing the present SWM status identifying the associated challenges and deriving potential solutions for the MSWM in the Indian context. The unsorted solid waste at source, social taboo, citizen's attitude, poor assessment, inadequate potential strategies unorganized informal sector of waste, unplanned fiscal, and poor implementation government policies.

The discussion in this review article concludes, there is an urgent need for adequate treatment and recycling strategies required to be adopted as per the Indian solid waste composition. The appropriate implications of the potential solutions for MSW at the centralized and decentralized level need to be emphasized through various available of scientific treatment processes. Hence municipalities, along with the involvement of informal sectors and private agencies required to focus on creating potential opportunities and achieve the long term goal of the MSWM sustainability for Indian cities. (Akhilesh Kumar and AvlokitaAgrawal, 2020).

Across India, existing systems for the collection, transportation and disposal of solid waste are mired in chaos. The problem is more acute in the urban areas, where rapidly growing populations generate increasingly larger quantities of solid waste that urban local bodies (ULBs) are unable to manage effectively. Improper management of solid waste poses risks to the environment and public health. This paper dissects the state of solid waste management in India and offers recommendations to solve the myriad challenges (Satpal Singh2020).

In The study finds that the food waste improperly dumped will produce methane gas that produces 21 times greater impact on global warming than carbon dioxide. The main aim of the study is to find out the challenges managing waste generation till recycling stage and also examine feasibility of technical, economic and environmental aspects of the waste management. This study will be a cross sectional descriptive study (R. Gajalakshmi, Dr.S.K. Manivannan, 2020).

Though decentralized system run on smaller scales, but with the effective participation of people as stakeholders gave rise to the waste traders or “raddiwallas” who are seen at various spots of the cities, who sell the recyclable wastes to make their fruitful use. Due to all these approaches, decentralized system is leading to a greater success in recent

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times. Advanced locality model is a type of optimization model for SWM system (Ankita Majumdar, 2019).

The present system is focused on collection and transportation of largely mixed unsegregated waste. Resource recovery from the waste and safe disposal of the residual waste in scientifically designed landfills are grossly neglected. Rules have now been put in place for sustainable solid waste management, but the capacity to plan and manage the system and ensure the enforcement of the rules is a major challenge (I.J.Ahluwalia and Utkarsh Patel, 2018)

The study is to examine the current and environmental compliance status of the solid waste management system of Rohtak city. Total waste generation of the city is 189 MT/day and per capita, waste generation is 0.4 Kg/person. For proper management whole city is divided into six zones. Among which zone five and six covers surrounding nine villages (Meena Deswal, J.S. Laura, 2018). This research study has been providing a flexible framework to quantify environmental impacts of improper solid waste management. Solid waste management (SWM) has become an issue of increasing global concern as urban populations continue to rise and consumption patterns change (Yakub Ansari, F.A.Chavan, 2017).

The present study was taken to find out the problems and prospects of solid waste in one of the campus of Poornimasansthan i.e. Piet, Jaipur. This paper presents an assessment of the existing situation of solid waste management (SWM) in Poornima campus, Jaipur (Vikas Sharma, Amit Sharma, Kunal Singh Sindal, 2017).

In India, approach towards Solid waste management is still unscientific. Solid Waste collection efficiency in India is around 70% (Sharholy et al. 2007), while same is almost 100% in the developed countries. Even today, large portion of solid waste is dumped indiscriminately on outskirts of towns or cities without any prior treatment. This leads to groundwater contamination and increase in air pollution due to leachate percolation and release of gases respectively (Abhishek Nandan, B. P. Yadav, Soumyadeep Bakshi, Debajyoti Bose, 2017).

In this paper, an attempt is made to evaluate the major parameters of MSWM, in addition to a comprehensive review of MSW generation, its characterization, and collection and treatment options as

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practiced in India (Rajkumar Joshi and Sirajuddin Ahmed, 2016).

In this paper, we explore the case study of Mumbai and adjoining area of Thane, where various attempts are made by citizens and organizations to make an effort to manage their waste in a decentralized manner.

The sampling of the report has case studies of one active citizen; two housing complexes (that have 25 and 210 flats respectively); a 50 flat apartment complex (that has flourished to growing their own food); an industrial colony (with their own residential space); a college (that efficiently segregates examination papers); and a Bio-Medical Waste Management Plant (that funds sustainability projects). Each of them are lessons to prove that the notion of decentralized waste management is not just a thought of academia but of practice.

This paper explores the scale at which different institutions/communities have taken efforts to successfully manage their waste. Most people are unable to achieve 100% decentralized management due to lack of appropriate channels for managing rejects and sanitary waste (HamsaIyer, 2015). The present study aims at providing an overview of the existing solid waste management practices in Chandigarh, a top tier II city in India and suggests solutions to some of the major problems being faced by the existing system. An average of 370 tons/day of solid waste is generated in Chandigarh municipal corporation area (Rishi Rana, Rajiv Ganguly, A.KGupta, 2015).

In this study, the municipal solid waste management and disposal methods in Abakaliki Metropolis, Ebonyi State, Nigeria is presented. The characteristics and composition of these wastes and the environmental issues associated with its management are also investigated. Structured questionnaires were used to obtain primary data from a random size of population in the areas that have the highest accumulation of heaps of solid wastes in the Government designated waste dumping sites and open spaces on the major streets within the metropolis (Patrick AkataNwofe, 2015).

The objective of this thesis is to use the available MCDM techniques in order to assist people involved in managing the solid wastes. This thesis is divided in two parts: first MCDM techniques have been applied to municipal solid wastes (MSW) and second, the same techniques have been

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applied to hospital waste scenario (Sheeba Khan, 2010).

Processing, Treatment and Disposal of Solid Waste

The processing technologies currently adopted in India include composting, biomethanation, recycling, refuse-derived fuel, incineration, pyrolysis, waste-to-wealth and waste-to-energy. Which technology is used depends on a variety of factors: the kind and quantity of waste available and its calorific value, fund and resource availability, capital investment, cost recovery, in-house capacity of ULBs, land availability, and environmental sensitivity to locations (Satpal Singh, 2020).

Due to industrialization, urbanization and increase in population density, there has been an increase in the accumulation of wastes. In order to reduce the load of wastes on earth, the collection, transport, recycling and disposal of wastes needs to be improvised. Various techniques are used for the management of wastes which includes land filling, incineration, anaerobic digestion, pyrolysis, plasma gasification, recycling, composting. Land filling and incineration pollute the atmosphere by releasing toxic and greenhouse gases into air. Anaerobic digestion produces bio fuel in the form of biogas. Plasma gasification results in the generation of electricity from wastes. Recycling of wastes involves the collection, sorting and reprocessing of wastes into new products (Muzaffar Ahmad Bhat Barkatullah, A. Wani AdilSagar, Bhat Mohammad Sikander ,Yaqoob Lone Sagar, Junaid Ahmad. Malik, 2021).

For the generation of database survey with the questionnaire was conducted. For spatial representation of database Top sheet (H43W9) was purchased through SOI Chandigarh. Secondary data regarding waste generation, collection system, disposal method and working zone distribution for waste management and medical waste was collected through Municipal Corporation of Rohtak (MCR).

The dumpsite characteristics of waste are considered most useful as it is only the source for the establishment of the treatment project for the municipal waste. Bulk density, moisture content, dry density, calorific value and C/N ratio of dumpsite waste, was determined by standard methods for which ten samples of 10 kg each were collected separately, mixed and brought to analytical size by quartering method. Data regarding a

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number of bins and their location was collected through survey and its service area was estimated through ArcGIS 9.3 by creating a buffer of 250 meters (MeenaDeswal and J.S. Laura, 2018).

The Solid waste categorization are Organic waste, Household waste, E-waste, Biomedical waste, Construction and debris, Inorganic waste. The following are the treatment methods which we are using provided below

Organic waste –Bio-composting
Household waste- Biomethanation
E waste- Recycling
Biomedical waste-.Burning
Inorganic waste -Land Filling.

This study covered Chennai and outer Chennai dumpsite. The aim of the study is to identifying the health and environmental impact of the solid waste disposal by the human which they are throwing around the dumpsite. The Health Hazard of the waste pickers and the constraints of separating will also be analyzed.

To present the findings on the Health and Environmental impacts caused by the solid waste disposal the Data for this study will be collected from both primary and secondary. The secondary data will be collected through books, journals of both published and unpublished source to gain the background information on health and environmental impact of the solid waste disposal.

Visiting the dumpsite and interview will be conducted among the scavenging and other people randomly. Also interview will be conducted among the Household residents who are living around the surroundings of the dumpsite. Based on the information gathered questionnaire will be developed how to alleviate the problems. To get the solid information structured questionnaires will be designed to households and waste pickers.

Questionnaire will be classified as first and second part in the first part data like educational level and employment will be yield. In the second part data will be on views of residents regarding to their dump site location and its surroundings, methods used for disposal by the residents and dump site implication to the health for the peoples staying near to the areas. (R. Gajalakshmi, Dr. S. K. Manivannan, 2020).

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Table 1-100% Door–to-Door Collection by Wards under SBM as of January 2020

States/Uts	Total Wards	Wards With 100% Door–To-Door Collection
Andhra Pradesh	3409	3409
Andaman and Nicobar	24	24
Arunachal Pradesh	75	75
Assam	943	698
Bihar	3377	3276
Chandigarh	26	26
Chhattisgarh	3217	3217
Daman & Diu	28	28
Dadra & Nagar Haveli	15	15
Delhi	294	294
Goa	217	217
Gujarat	1427	1427
Haryana	1496	1401
Himachal Pradesh	497	490
Jammu & Kashmir	1081	809
Jharkhand	932	897
Kerala	3536	3022
Karnataka	6464	6464
Madhya Pradesh	7115	7115
Maharashtra	7322	6590
Manipur	306	270
Meghalaya	114	27
Mizoram	264	264
Nagaland	234	148
Odisha	2024	2009
Puducherry	122	122
Punjab	3123	3064
Rajasthan	5389	5389
Sikkim	53	53
Tamil Nadu	12814	12429
Telangana	2112	2020
Tripura	310	277
Uttar Pradesh	12007	11827
Uttarakhand	1170	1170
West Bengal	2938	2527
Total/Average	84475	81135

(Satpal Singh)

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Table 2-Change in Composition of Municipal Solid Waste with time (in %)

Year	Biodegradables	Paper	Rubber/Plastic	Metal	Glass	Rags	Others	Inert
1996	42.21	3.63	0.60	0.49	0.60	-	-	45.13
2005	47.43	8.13	9.22	0.50	1.1	4.49	4.02	25.16
2011	42.51	9.63	10.11	0.63	0.96	-	-	17.00

(Joshi AndAhemad)

Table 3- Solid Waste Generation & its nature in each zone of Sholapur City.

Sr. No.	Zone No.	Biodegradable (Kg/d)	Recyclable (Kg/d)	Debris (Kg/d)	Green Waste (Kg/d)	Total (Kg/d)
1	Zone1	35000(50.05%)	20000(28.60%)	6000(8.60%)	9000(12.90%)	70000
2	Zone2	37500(49.80%)	18750(24.90%)	7500(9.90%)	11500(15.30%)	75000
3	Zone3	34000(52.40%)	15500(23.90%)	6200(9.50%)	9300(14.30%)	65000
4	Zone4	40000(53.20%)	12500(16.60%)	7000(9.30%)	15500(20.60%)	75000
5	Zone5	32000(49.20%)	16000(24.60%)	7000(10.70%)	10000(15.40%)	65000
6	Zone6	34000(48.60%)	15000(21.40%)	6000(8.60%)	15000(21.40%)	70000
	Total	212500(51.00%)	97750(23.50%)	39700(9.50%)	70050(16.80%)	420000

(B.L.Chavan, N.S. Zambare, 2013).

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