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SOLID WASTE MANAGEMENT IN URBAN HARYANA: A GEOGRAPHICAL ANALYSIS

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Introduction:

Solid Waste management includes all the steps starting from the collection, transportation AND processing to disposal, finally managing and monitoring of solid waste materials. This term usually refers to the materials produced by human activity which have no active value, and the process is generally undertaken to reduce their effects on health, environment or aesthetics. Solid Wastes are categorized into domestic/industrial which are further bifurcated in municipal, hazardous, medical and radioactive wastes. Managing solid waste generally involves planning, financing, construction and operation of facilities for the collection, transportation, recycling and final disposal of the waste.

In "Transforming Urban Waste Management in India," Mazumdar outlines the various tools to overcome the problems of urban waste management. The study recommends that urban waste management be streamlined using technology, and that the system of SWM be made techno-economically viable and sustainable.

In Urban areas, household waste is in major portion with a larger biodegradable and relatively smaller non-biodegradable content while commercial establishments generate large volumes of non-biodegradable waste and e-waste. Industries producing hazardous waste need specialized treatment before disposal. Thus, the different sources of waste generation require different management systems to deliver the most efficient results. The varying nature of solid waste generated by different areas may form the base for classification and identification of zones.

Keywords: Solid Waste management, Clusters, Collection, Segregation and Disposal, Planning and Development.

Discussion:

Haryana state came into existence on l November 1966 and presently has 22 districts and situated in North-Western part of India. According to the census of 2001, the population of Haryana was 2l.2 million, which increased to 25.4 million in the census of 2011. Currently, the population of Haryana can be estimated to 30 million. Out of total Population of Haryana, 34% is urban population.

Table 1: Haryana: Urban Population by Size-Class of Towns, 2001 and 2011

Size-Class of Towns/City 2001- 2011	Number of Towns 2001	Per cent Urban Population 2001	Number of Towns 2011	Per cent Urban Population 2011
Million-Plus City Class I	20	52.12	20	52.03
Large Towns Class II	7	6.79	11	7.99
Medium Towns Class III	26	12.98	45	14.87
Small Towns Class IV	36	8.68	34	5.80
Small Towns Class V	16	2.11	36	2.97
Small Towns Class VI	1	0.07	8	0.35
Classes I-VI	106	100.00	154	100.00

Source: Census of India, 2001 & 2011, Primary Census Abstract, Directorate of Census Operations, Haryana, Chandigarh.

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With the help of Table: 1, We can find that the Haryana has fast growing urban population. As per census 2011, the Haryana state has total 154 towns with different size of population and class. Million-Plus Class I cities are 20, Large Towns Class II cities are 11, Medium Towns Class III are 45, Small Towns Class IV are 34, Class V are 36 and Class VI are 8. Due to rapid changes in economic environment, urbanisation growth rate is quite high and current growth trend predicts that the urbanisation expected to grow exponentially in the upcoming years. Total number of towns increased from 106 to 154 i.e., in a decade, % increase in number of towns is 45% that works out to 4.5% yearly growth.

One of main functions of all urban centres and urban local bodies is management of municipal solid waste. There are various challenges faced by all the Urban local bodies in the management of Municipal Solid Waste from Door-to-Door Collection, source segregation, secondary storage, secondary transportation, processing and finally scientific disposal is severely lacking. The biodegradable and non-biodegradable wastes are disposed in common landfills. Most Urban Local Bodies (ULB's) are not able to provide effective and efficient services. They spend nearly 60%-70% of their total overall budgetary allocation only in collection, another 20%-30% on managing transportation, and less than 10% on the treatment and remaining on final disposal of MSW. In most of urban cities of India formal transfer stations and recycling facilities do not exist and the transportation by waste collection vehicles from the communal bins to disposal sites is very unscientific. Most of landfills are open, uncontrolled and poorly managed as a common sight across many large urban centres. Dump yards act as open landfills or heaps of garbage posing severe environment risks fires or emission of greenhouse gases, and hazards to public health through disease vectors such as flies & rodents. In Haryana, MSW management is even more haphazard and dismal in smaller towns and rural areas.

There are 88 Municipalities in the State out of which MC Manesar, Mandi Adampur, Badhda, Siwani have been recently notified as Municipalities. In 2021, Haryana has covered 1619 (98.35%) wards out of 1646 wards door-to-door waste collection services and source segregation has been initiated in 1185 (72%) wards. The detail on progress made by Local Bodies in respect of waste collection, segregation, transportation and disposal is given as:

Waste Collection: Door to door collection is being done in around 1619 (98.35%) out of 1646 wards and existing waste collection vehicles are being modified into two covered compartments for collection of dry and wet waste. Freshly, ordered vehicles will have two covered compartments for collection of wet and dry waste in a segregated manner. A Separate basket/bin is kept in waste collection vehicle/ tricycle for segregated collection of domestic hazardous waste. Urban local bodies are doing collection of domestic, trade and institutional food/biodegradable waste from the doorstep or from the community bin daily. Large containers are kept in the fruit and vegetable markets and removed during nighttime or non-peak hours by the local body.

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Table: 2: Urban Haryana: Solid Waste Management 2021

Sr.No	Description	Status
1	Total no of Urban Local Bodies	88
2	Number of class I & class II cities/towns	29
	Total No. of Wards	1646
3	No. of wards with 100% Door to Door Collection	1619 (98.35%)
4	No. of wards where segregation is initiated	1185 (72%)
5	Quantity of Solid Waste	5544 TPD
6	Quantity waste processed	3942 TPD (71.10 %)
7	Quantity of waste being processed	1602 TPD
8	No. of vehicles for D2D collection	4005
9	No. of vehicle with Compartment	3300
10	No. of vehicles with GPS	3120
11	Capacity of operational processing facility	3115 TPD
12	Capacity of Material Recovery Facilities	2589 TPD
13	Capacity of under construction processing facility	3061 TPD
14	Capacity of proposed processing facility with timelines	By December 2024
15	Good practices in cities/towns	YES (Overall)

Source: Annual Report on Status of Solid Waste Management Rules, 2016 in the State of Haryana (Urban and Rural) , Haryana State Pollution Control Board

Transportation: For transportation, covered containerized handcarts/tricycles/ Tractor Trolleys are used for the primary collection of waste from sources of waste generation. For solid waste transportation from the Primary Collection Centre (PCC) to the processing plant or sanitary landfill site, "Dumpers with twin bin containers" are used.

Segregation: Only 72% source segregation has been achieved in 1185 wards out of 1646 wards.

Disposal: Residuals collected from the above-mentioned processes are disposed in dumping sites and further proposed to be processed for energy recovery.

As per the below table 3, it is observed that Gurugram, Faridabad, Rewari & Sonipat are leading districts in waste generation due to high urbanisation.

Under current SWM rules there is no incentive for waste-pickers, nor do they recognise the economic value of informal waste recycling work. Under the new rules, municipalities are directed to include the informal waste-pickers in their waste-management process. Under the Swachh Bharat Mission-Urban (SBM-U), the Government of India has published a guide, "An Inclusive Swachh Bharat through the Integration of the Informal Sector: A Step-by-Step Guide," to help ULBs and states integrate informal waste-pickers and promote the reuse and recycling of solid waste.

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Table: 3, Haryana: Estimated SW Generation by Main Urban Population

District	Urban Population 2011	Projected Urban Population 2021	SW generated (kg/capita/day), CPHEEO	SW generated 2011 (MT/day)	SW generated 2021 (MT/day)	
Faridabad	1,438,855	2,438,000	0.5	719.42	1219.00	
Palwal	236,544	448,502	0.2	48.59	89.70	
Rohtak	446,164	860,896	0.3	129.64	258.26	
Panipat	555,085	993,991	0.3	174.13	298.19	
Sonipat	453,364	1,303,434	0.3	136.00	391.03	
Gurgaon	1,042,253	2,589,917	0.5	524.86	1294.95	
Mewat	124,106	179,385	0.1	10.00	17.93	
Jhajjar	243,339	687,964	0.3	76.706	206.38	
Rewari	233,430	1,145,911	0.3	68.50	343.77	
Total	4,773,140	10,648,000		1,887.846		4,119.21

Source: Estimation based on Census of India, 2011 & Projected population, Town and Country Planning Department, Haryana

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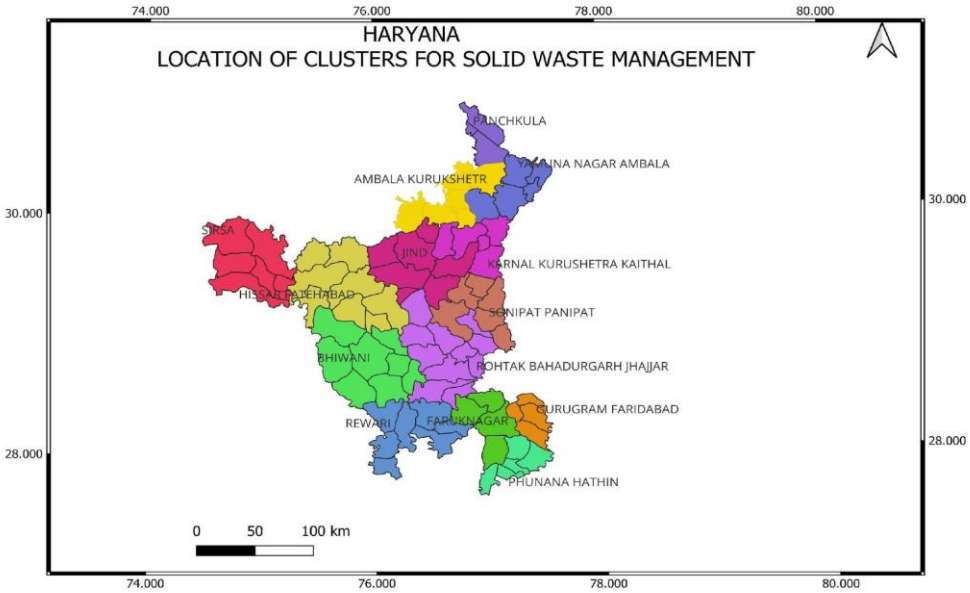

Source: Reports concerned Municipal Corporations/Committees

The Integrated Centralized Waste Processing Approach (Cluster Wise) is being adopted as a long-term approach within an overall objective to setup regional Waste to Energy & Waste to Compost + RDF processing facilities. This approach is more coveted considering the constraints posed by the

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decentralized approach and its sustainability over long run. As part of this approach, total 13 Cluster have been formed covering all the ULBs. Two Waste to Energy clusters having average solid waste conversion quantum more than 500 TPD and remaining Eleven (11) are Open technology cluster. Now, all environmental clearance conditions has been worked out for Gurugram-Faridabad cluster and land reclamation is under process for setting up of plant. Remaining 11 clusters are based on open technology and the selected agency has to decide the technology. On daily basis, urban local bodies are collecting domestic and institutional and biodegradable waste from the doorsteps or from the community bin. Local bodies are using containerized handcarts/tricycles/ Tractor Trolley / Refuse Compactor or other similar means for the primary collection of waste stored at various sources of waste generation.

Table :4: Haryana: Clusters For Solid Waste Management

Sr. no	Cluster	No of urban centres	Name of ULBs within Cluster	Waste Generation & Capacity (TPD)	Technology Proposed
1	Gurugram-Faridabad	2	Gurugram-Faridabad	2300	Waste to energy
2	Sonepat-Panipat	4	Sonepat, Panipat, Samalkha, Ganour	700	Waste to energy
3	Ambala-Yamunanagar	7	Ambala, Naraingarh, Yamuna Nagar, Radaur, Barara, Sadhura	675	Waste to Compost/ RDF
4	Karnal-Kaithal-Kurukshetra	18	Indri, Nilokheri, Tarori, Karnal, haraunda, Nissing, Assandh, Thanesar, Shahbad, Ladwa, Kaithal, Kalayat, Rajound, Cheeka Pundri	590	Waste to Compost/ RDF
5	Rohtak-Bahadurgarh Jhajjar	12	Kalanaur, Meham, Rohtak, Gohana, Bahadurgarh, Kharkhoda, Julana, Jhajjar, Sampla, Beri	601	Waste to Compost/ RDF
6	Hisar-Fatehabad	10	Hisar, Barwala, Hansi, Siwani, Fatehabad, Bhuna, Uklana Mandi, Ratia,Tohana, Jhakal Mandi	407	Waste to Compost/ RDF
7	Panchkula	2	Panchkula Kalka	215	Waste to Compost/RDF
8	Bhiwani	5	Bhiwani, Bawanikhera, Charkhi Dadri, Loharu, Badhra	155	Waste to Compost/ RDF
9	Jind	7	Jind, Narwana, Narnaund, Sisai, Bass	181	Waste to Compost/RDF
10	Sirsa	5	Sirsa, Rania, Ellenabad, Kalanwali, Mandi Dabwali	168	Waste to Compost/RDF
11	Rewari	5	Bawal, Dharuhera, Rewari, Mahendergarh, Kanina	146	Waste to Compost/ RDF
12	Punhana	8	Punhana, F/Jhirka, Hathin, Hodal, Palwal, Sohna, Nuh, Tauru	466	Waste to Compost/RDF
13	Farukhnagar	3	Farukh Nagar, Haily Mandi, Pataudi	26	Waste to Compost/RDF

Source: Annual Report under the Solid Waste Management Rule, 2016 for the year 2020. (Haryana State Pollution Control Board)

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Issues and Challenges in Solid Waste Management in Urban Haryana:

No organized and scientifically planned source segregation.

- Municipal solid waste is usually disposed in dumps without any treatment causing severe environmental and health risks.
- Lot of materials can be recycled from waste which can be then input for manufacturing of particular significance are cellulosic materials, plastic, metals and glass.
- A vigorous policy framework to give a direction and thrust to environmentally sound waste management is required.
- Availability of funds to support waste management is one of the challenging issue.

Conclusion: In last, Current paper describes definition of solid waste management and challenges faced by Municipal Committees from collection to final disposal of waste in Haryana state. With rapid urbanization, SWM planning is becoming complicated with rapid increase in generation of solid waste. Now municipalities are planning to convert solid waste into energy in place of land filling despite challenges in collection, transportation and segregation of solid waste.as depicted in paper urbanisation in Haryana is growing 5% annually resulting in high impact on existing solid waste management system. With a lot of challenges from educating citizens to system a lot work has to be done to strengthen solid waste management. From individual to cluster-based disposal of solid waste will result in effective disposal of solid waste

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