Urban Solid Waste: An Ecological Mess with Reference to Assessment and Management

Anil Kumar Dular
Department of Environmental Science
Maharaja Ganga Singh University, N.H 15, Jaisalmer Road, Bikaner, Rajasthan 334004.India

Abstract: **A study on status of urban solid waste or called municipal solid waste in the ward no. ten of Jhunjhunu which is located at 28º 06' North to 75º 20' East has been survey on basis of lower income group, middle income group and higher income group of residents. The sample was collected in municipal areas category within residential area of the vicinity. The physical composition and per capita generation of solid waste were analyzed respectively. The present investigation is undertaken with an intention of evaluation of solid waste produced in city both quantitatively or qualitatively in term of their physical composition and suggestive management measures.**

I. INTRODUCTION

All human activities inevitably produce some waste and waste from urban areas commonly exceed the carrying capacity of the biosphere to absorb and the urban ecosystem to recycle (Sinha 1991).The solid waste comprises so many ingredients. Waste management is becoming a serious environmental problem with resource exhaustion and waste generation. The present investigation with evaluation of the status of urban solid waste and traditional or innovative technique use for management of the solid waste generated from municipal area. The classification of urban solid waste like refuse, garbage, ashes, dead animals, paper, plastics, glasses and household waste are advent with complexity of throwaway society.

II. MATERIAL METHODS

Assessment of quantity of waste generation in municipal area in different communities of urban society. The preliminary information shall be gathered from different communities by using questionnaire and statistical analysis was carried out on basis of data collected. Personal interview with corporation official and public shall be taken by survey of the study area. Sampling of urban solid waste was done in different households randomly incorporating with various income groups so that higher income group, middle income group and lower income group. During the sampling urban solid waste was collected and segregated on basis of their physical composition like refuse (non degradable) or garbage (degradable) (Anon 1980). The urban solid waste was collected from area randomly with two variables the independent one is socioeconomic status and independent one is domestic waste generated in area weighed separately on a digital balance. Calculation can be done by using central tendency formula of mean.

III. RESULT AND DISCUSSION

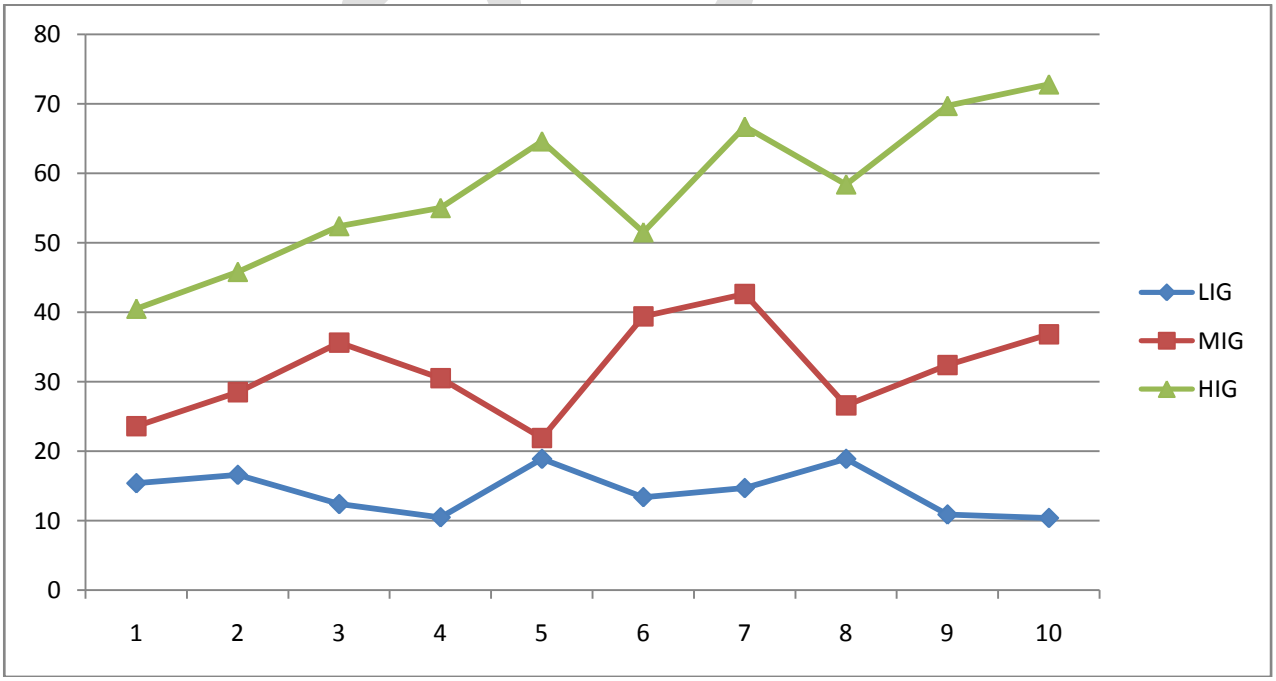
The characterization of urban solid waste helps in management strategy including storage of solid waste, segregation at the source, collection and transportation, treatment and disposal, institutional reorganization with manpower, legal instrument, and people participation. The management strategy includes material flow in society, with reduction of raw material usages, reuse of material and energy recovery. The present study has been carried out to assess the solid waste generation on basis of various income groups at ward no.10 in Jhunjhunu located at 28º 06' north to 75º 20' east latitudinal position. The district Jhunjhunu fast growing cities in Shekhawati region conventionally differentiated into three major areas like residential area further categorized into upper class, middle class and lower classes with their income status. Sampling can be done by generating waste collected in polythene bags from various vicinity and analysis of waste on ground of physical composition given in table(1) there should be positive relationship between socioeconomic status and domestic waste generation.

Table (1) Quantity in gms and categories of urban solid waste generated among various communities

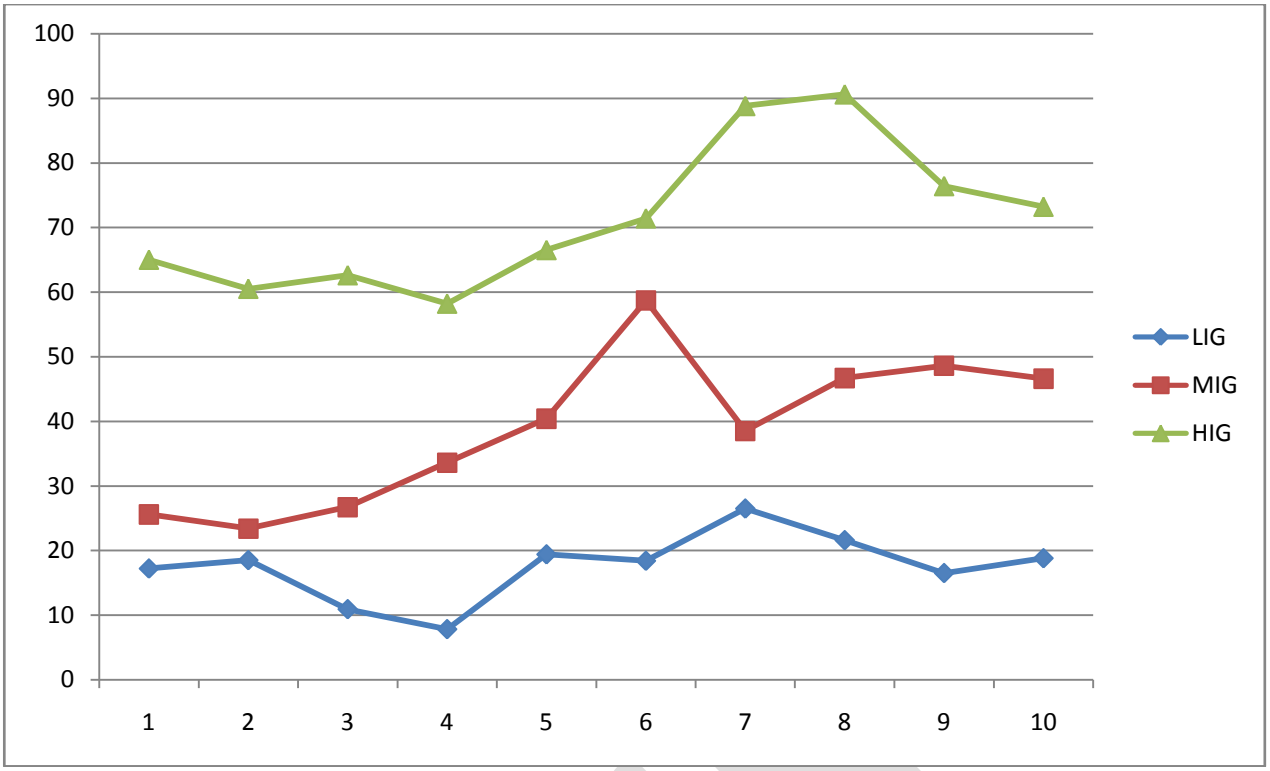
House No.	Papers			Plastics			Glasses			Kitchen waste		
	LIG	MIG	HIG	LIG	MIG	HIG	LIG	MIG	HIG	LIG	MIG	HIG
1.	15.4	23.6	40.5	17.2	25.6	65.0	1.9	5.5	20.3	120	220	580
2.	16.6	28.5	45.8	18.5	23.4	60.5	2.4	3.9	25.6	150	230	490
3.	12.4	35.6	52.4	10.9	26.7	62.6	2.8	4.5	34.9	145	285	610

4.	10.5	30.5	55.0	7.8	33.6	58.2	1.2	6.5	42.6	148	270	740
5.	18.9	21.9	64.6	19.4	40.4	66.5	-	5.2	28.6	260	340	790
6.	13.4	39.4	51.5	18.4	58.7	71.4	0.9	8.4	32.0	275	325	690
7.	14.7	42.6	66.7	26.5	38.5	88.8	2.9	14.5	40.6	330	380	810
8.	18.9	26.6	58.4	21.6	46.7	90.6	1.8	12.5	38.4	290	410	825
9.	10.9	32.4	69.7	16.5	48.6	76.4	1.6	9.4	32.4	354	525	900
10.	10.4	36.8	72.8	18.8	46.6	73.2	1.4	10.5	28.4	370	535	925
Total	142.1	317.9	**577.4**	**175.6**	**388.8**	**713.2**	**16.9**	**80.9**	**323.8**	**2442**	**3520**	**7360**
Mean	**14.21**	**31.79**	**57.74**	**17.56**	**38.88**	**71.32**	**1.69**	**8.09**	**32.38**	**244.2**	**352.2**	**736**

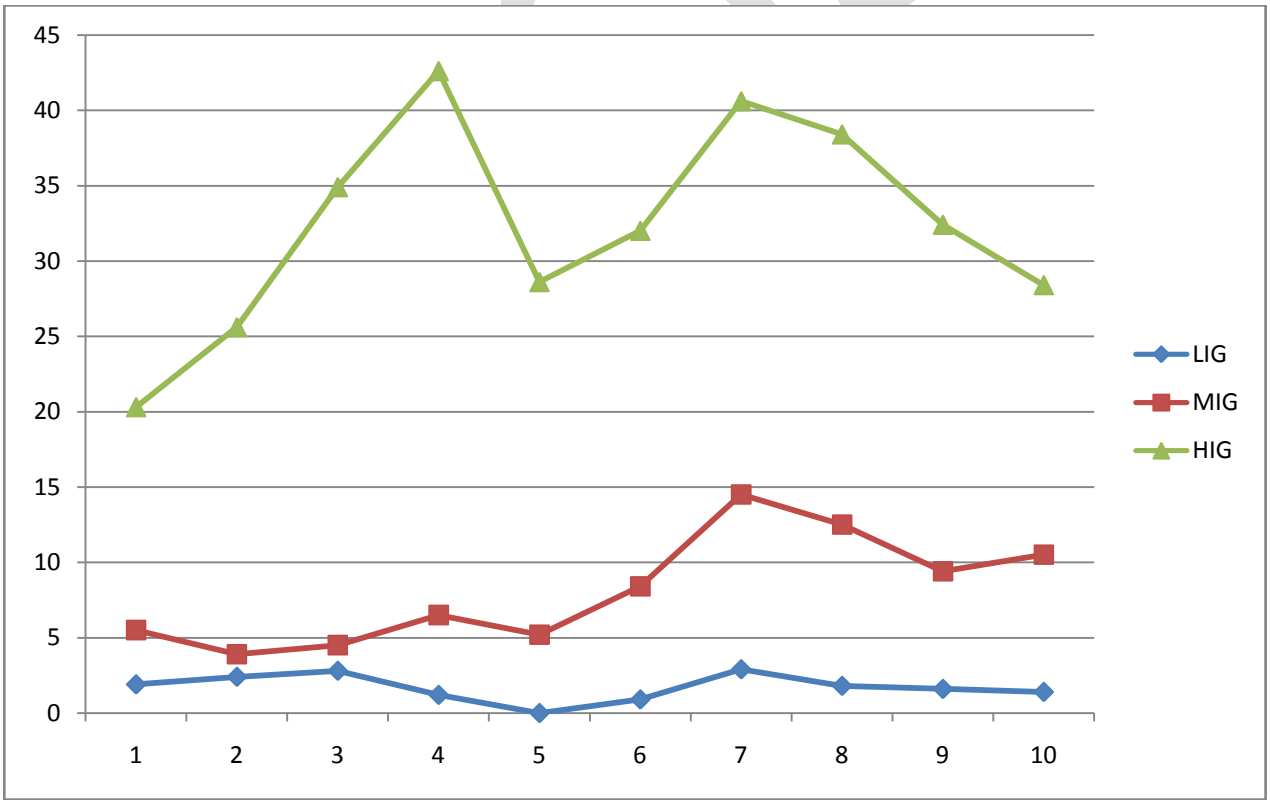
Study reveals that total quantity of mean waste generation in gm/day related to papers and related products for LIG, MIG, and HIG is 14.21gm/day,31.79gm/day, 57.74gm/day respectively, shows that paper based articles are highly used by high income group followed by middle and lower income group. Plastics as content of solid waste generated 17.56 gm/day,38.88gm/day and 71.32gm/day respectively for lower, middle and higher income group. It shows that generation of plastics is more by higher income group as the tendency and throwaway nature. Glass component as solid waste is less generated rather other shows 1.69gm/day, 8.09gm/day and 32.38gm/day respectively for lower, middle and higher income groups. In biodegradable nature of waste like kitchen waste generated by different communities like lower, middle and higher is 244.2gm/day, 352.2gm/day and 736gm/day respectively. The study shows that due change in consumption pattern and fast food culture in cities generated more kitchen waste in coming years. The study reveals that monthly generation of waste refuse and garbage category is 3112.2gm/months for papers and products, while for plastics it is 3832.8gm/month, glass content comprises waste is 1262.1gm/month and quantity of garbage category as kitchen waste is 39972gm/month. So the solid waste generation of all categories with different communities is 48179.1gm/month. The comparative analysis of all three categories or communities of household of study area with composition of waste refuse as well as garbage revealed that high income group is generated highest value of all category of solid waste which reflects the living standard and lifestyle. A cause- condition relationship between waste generations is directly proportionate to the resource consumption for all the categories.



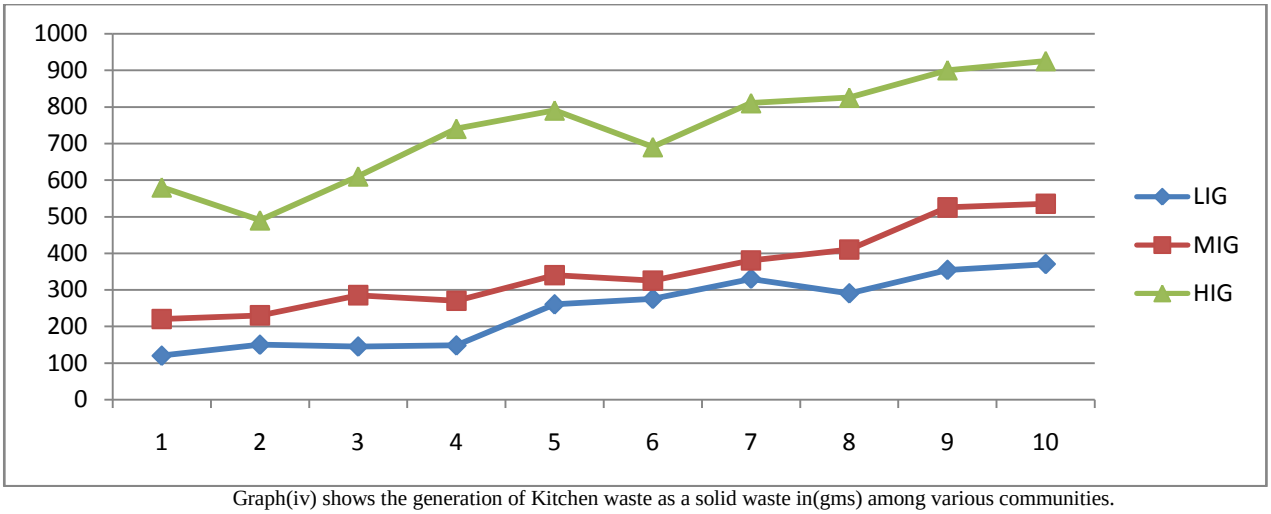
Graph (i) shows the generation of papers as a solid waste in (gms) among various communities.



Graph(ii) shows the generation of Plastics as a solid waste in(gms) among various communities.



Graph (iii)shows the generation of Glasses as a solid waste in(gms) among various communities.



Graph(iv) shows the generation of Kitchen waste as a solid waste in(gms) among various communities.

Table(2)Physical composition of urban solid waste in study area in perspective of Indian scenario.(Source :Sinha Rajiv .K 1991)

SNo.	Waste component	Value in percentage %
1.	Vegetables, fruits and animal matters	27%
2.	Dry grass and leaves	5.60%
3.	Paper and producrs	10.9%
4.	Plastic matewrials	5.4%
5.	Leather and human hair	3.7%
6.	Cotton, jute ,burlops, clothes	6.10%
7.	Rubber items	2.9%
8.	Metals	2.0%
9.	Concrete, pebbles, sand dust	25.0%
10.	Ashes	9.0%
11.	Wood	0.40%
12.	Glasses and ceramics	2.00%

Planning and management of urban solid waste: In the study area storage of solid waste is generally in open waste bins, casually collection of waste can done by tricycle bins open tractors usually. The haulage of solid waste in open containers at transfer station which is nearly 10-15 km in outskirt of the city, generally on government land and low lying areas with no proper treatment and disposal facility. It is recommended that for proper management emphasis will be given on sanitary landfill, reuse and recovery aspects with decentralization of municipal services along with financial, institutional, legal and people participation aspects. Some innovative tools and techniques are also recommended like composting, vermiculture, refuse derived fuel (RDF) so on (Hosteii and Kumar) 1998.

IV. CONCLUSION

A comparative analysis of all three category of income groups of the study area revealed that high income household exhibit highest value of solid waste generation followed by middle income group and generation of solid waste least by low income group. The resident of all three categories usually prefer packed material and thereby the concentration of kitchen and plastic contain in solid waste is more, while paper and glasses are comparatively less. The concentration of kitchen waste as biodegradable waste generated maximum from higher income group due overconsumption and relies on fast food culture followed by middle and lower one. The total generation of refuse in study area is 8207gm per month, and degradable (garbage) waste generated is 39972gm per month.

REFRENCES

[1] Anonymus, 1980. Indian standard guidelines for management of solid waste management: ISSN:9622, Institute Standard Institute,pp20**.**

[2] Sinha, Rajiv K.1991 The ecological management of urban solid waste for human survival Journal of the Institute of Public Administration; regional centre for urban environmental studies University of Lucknow, Vol.6 No**.**1-4.

[3] Hosteii B.B and Kumar A. 1998 Environmental Impact Assessment and Management- ISBN 81-7035-182-0 Daya Publishing House New Delhi.