



"SCENARIO OF SOLID WASTE IN VIJAYANAGARA ZONE IN BANGALORE CITY - A CASE STUDY"

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ABSTRACT :

Bangalore city the capital of Karnataka has a huge area of around 600 km² with a population of about 102 million (2018). City has 198 BBMP wards and they have been further sub divided into eight corporation zones for the purpose of urban administration including solid waste management. Unfortunately continuous growth of city both in its area and population and also rising consumption management of solid waste is a challenge to BBMP. Added to this influx of people from different parts of India like Orissa, Bihar and Uttarpradesh and increase of apartment, malls have added their share of burden to the solid waste management. Present article on scenario of solid waste in Vijayanagara zone in Bangalore city. A case study forms a fraction of the whole problem of solid waste management.

KEYWORDS : Solid Waste, Sustainable development, BBMP, Vijayanagara zone.

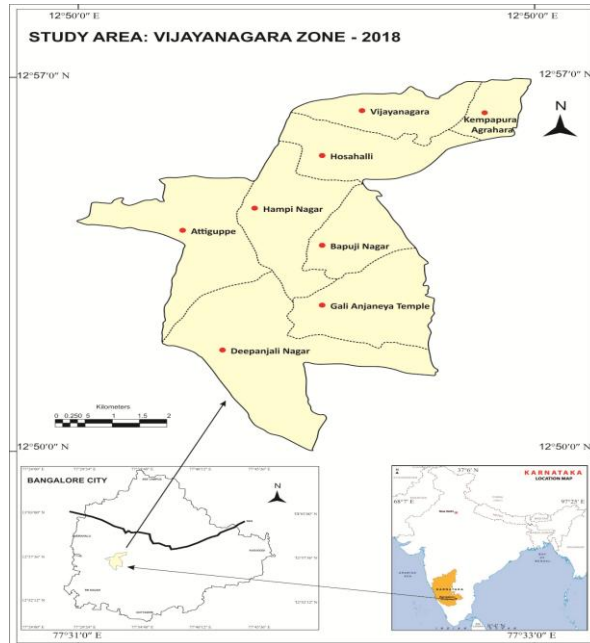
INTRODUCTION

Growing cities like Bangalore along with various environmental problems have rising solid waste problems. A traverse across Bangalore cities shows that hundreds of spots with heaps of uncleaned solid waste. It has eight broad zones covering 198 wards of BBMP area of 704km². Present area of investigation Vijayanagara subzone constitute just eight wards in the south western parts of city it account for 8.4km² with eight wards. Preliminary data shows this zone on an average produces 116 tonnes per day (tpd) of solid waste. It consists of around 72tpd (62%) of wet waste and about dry waste of 38%. Solid waste from this zone ends up in land filling sites of Chickanagamagala (mixed waste). However, Bellahalli in southeast of Bangalore city receives wet waste for the manufacturing of compost manure. Being mainly residential area Vijayanagara zone produces least amount of Medical waste and Electronic waste which need detailed study through primary and secondary data from eight wards and also from BBMP.

STUDY AREA:

Management of solid waste is still a big problem in big cities including Bangalore. As on today (2017-18) Bangalore City produces around 4000 tpd. of solid waste. Vijayanagara zone, present study area covers select eight wards accounts for 8.4 km² area and 3, 24, 375 population. It is broadly a middle income and lower income group house hold zone. It lies within southern zone of Bangalore city.

It has one urban metamorphosed village Hosahalli and some slum resembling limited areas to its eastern section along Bangalore Mysore railway line which passes through this zone.



Map 1: Study area of Vijayanagara Zones.

OBJECTIVES :

Present investigation Solid Waste Disposal and management in Bangalore City with special reference to Vijayanagara zone aims to provide spatial perception to the solid waste in the study area. It has following major objectives.

1. In order to give focused view of solid waste about eight wards under Vijayanagara zone which have been selected ward wise prevention of solid waste generation method of its collection form one of the objectives.
2. Though field study, data has been collected not only on solid waste generation but also its composition into wet, dry and other kinds of solid wastes.
3. Such generated waste method of disposal is one of the major objectives of the present investigation of Vijayanagara zone being a micro zone (1.06%). Solid waste normally ends up outside the zone in terms of disposal. Such destination have been studied.
4. Present investigations a unique objective of looking at its efficient management and sustainable issues of solid waste in relation to Bangalore city.
5. One of the objective is to offer viable strategies for the good of local environment by minimizing spot incineration (parks, play ground etc)
6. A serious attempt is being made to analyze the non biodegradable small industrial establishment within the region

Generation of solid waste in Vijayanagara zone in its wards:

Eight selected wards of Vijayanagara zone in Bangalore city accounts for 0.01% of area where Bangalore city total area is 709,49km². This zone accounts for 3.84% of city's population of 84,43,675. Vijayanagara zone has 3.76% of households in Bangalore city. This zone also has a total Road length of 1.98% of Bangalore city roads of 13,483km. In Vijayanagara sub division selected eight wards have residential area which contributes more domestic, wet and dry solid waste. According to a recent estimate of a study (Ramachandra T.V 2018) generation of solid waste it is said that in Bangalore 580 gms of solid waste is generation per person. As Vijayanagara zone has 3,24,375 population (2001) if we

take nearest value of 580gm solid waste as 600gms per person, the total solid waste generation is around 194tpd (2017) in the Vijayanagara zone.

Table No-1										
SOLID WASTE GENERATION IN VIJAYANAGAR ZONE,2016-17										
Sl. no.	Ward no.	Ward Name	Area (km ²)	%	Population	%	Households	%	S.W (Kgs)	%
1	132	Attiguppe	1.4	16.6	41,487	12.9	10,576	13.3	8,256	6.32
2	134	Bapuji Nagar	0.7	8.3	49,484	15.2	10,647	13.4	10,223	7.80
3	158	Deepanajali Nagar	2.1	25.0	45,928	14.1	11,676	14.7	9,027	6.90
4	157	Gali Anjaneya Temple	1.1	13.0	34,653	10.6	8,668	10.9	66,210	50.70
5	133	Hampi Nagar	1.1	13.0	35,113	10.8	8,456	10.6	6,698	5.10
6	124	Hosahalli	0.9	10.7	37,347	11.5	9,068	11.5	9,229	7.00
7	122	Kempapura Agrahara	0.4	4.7	40,032	12.3	10,051	12.7	10,376	7.90
8	123	Vijayanagara	0.7	8.3	40,331	12.4	9,943	12.5	10,477	8.00
Total			8.4		3,24,375		79,085		1,30,496	

Table No-2											
COMPOSITION OF DOMESTIC SOLID WASTE IN VIJAYANAGAR ZONE 2016-17											
Sl. no.	Ward no.	Ward Name	Wet Waste		Mixed Waste		Dry waste		Total (TDP)	E-Waste	Others stores etc.
			TDP	%	TDP	%	KGS	%	TDP		
1	132	Attiguppe	9.25	61.0	5.25	34.0	750	5.0	15.25	N.A	N.A
2	134	Bapuji Nagar	8.50	52.0	7.50	45.0	500	3.0	16.50	N.A	N.A
3	158	Deepanajali Nagar	10.50	60.0	6.50	37.0	500	3.0	17.50	N.A	N.A
4	157	Gali Anjaneya Temple	8.40	63.0	4.30	32.0	700	5.0	13.40	N.A	N.A
5	133	Hampi Nagar	8.50	55.0	5.50	38.0	500	3.0	14.50	N.A	N.A
6	124	Hosahalli	9.70	58.0	6.30	38.0	700	4.0	6.70	N.A	N.A
7	122	Kempapura Agrahara	8.50	52.0	7.50	45.0	500	3.0	16.50	N.A	N.A
8	123	Vijayanagara	8.50	55.0	6.50	42.0	500	3.0	15.50	N.A	N.A
Total			71.85		49.35		4650		115.85		

ATTIGUPPE:

Attiguppe has an area of 1.4sqkm (16.6%) Geographically it is the western most ward in the Vijayanagara zone. It has a total population of 41,487(12.78%) (2011) in 10,576 households. However, by 2016-17 number of households have increase to 12,780. It is more or less a middle and lower

middle class residential ward, where higher income group households account for 12.1%. Whereas, middle and lower income households together account for 87.9% of the total households. It produces around 8,256kgs (6.32%) of solid waste and most of it is domestic solid waste. Solid waste composition of Attiguppe ward comprises 61% of wet type of solid waste, 34% of mixed type of solid waste and 5% of domestic level biomedical waste.

BAPUJINAGAR:

Bapujinagar ward lies to the central western section of the study area. It has an area 0.7sqkm (8.3%) to its north as Hosahalli ward and towards west it has Hampinagar and to south it has Galianjaneya temple ward to its east it has new timber yard of south zone of Bangalore city. Bapujinagar had 49,484 population in 2011. It had 10,647 households in 2011 and they have increase to about 13,000 in 2016-17. It is predominantly middle income and lower income group locality. Where, high income group household account for only 22% of the total households of this ward. It produces around 1,0223kgs (7.8%) of solid waste and most of it is domestic solid waste. Solid waste composition of Bapujinagar ward is comparatively produces 52% of wet type of waste, 45% of mixed type of waste and middle class residential area comprises 45% of solid waste under mixed type. In terms of biomedical waste account for 3% in domestic level Biomedical waste.

DEEPANJALI NAGAR :

Deepanjalinagar ward lies to the southernmost edge of not only study area but also south zone of Bangalore city (BBMP). To the north it has Attiguppe, Hampinagar and also Galianjaneya temple wards. To its south and southeast it has Girinagar ward of western BBMP division of Bangalore city. Deepanjalinagar area is 2.1sqkm. It has a population of 45,928 (2011) it has about 13,226 total households. In which high income group account for 6.15% mixed type around 39% and lower income group 55% of households. It produces around 9,027kgs (6.9%) of solid waste and most of it is domestic solid waste. Solid waste composition of Deepanjalinagar ward comprises 60% of wet waste, 37% of mixed type of solid waste and 3% of biomedical waste in the total domestic level solid waste.

GALIANJANEYA TEMPLE:

Geographically it lies to the south central section of Vijayanagara zone. Galianjaneya ward has an area 1.1sqkm (13.0%) it has a population of 34,653(10.6%) (2011) in about 9,904 households. Where high income households account for nearly one percent and generates 1.2% of solid waste in the ward. Middle income group household account for nearly 44% of households and generates about 48.8% solid waste. Lower income group households accounts for closer to 56% and generates almost 50% of the solid waste generated in this ward. It produces around 6,6210kgs (50.7%) of solid waste and most of it is domestic solid waste. Solid waste composition of Galianjaneya temple ward account for 63% of wet waste and lower middle class households contribute 32% of mixed waste generated in this ward. The very composition of households commercial establishments denote and contribute 5% of solid waste in the form of dry waste (Biomedical waste) in the total domestic level solid waste.

HAMPINAGAR :

Hampinagar ward lies almost central part of the Vijayanagara zone to its north it has Hosahalli ward towards east, it has Bapujinagar ward, to the south it has Galianjaneya temple ward and Deepanjalinagar wards. To its west it has Attiguppe ward. In term of area it has 1.1sqkm (13.0%). As per the 2011 censuses Hampinagar ward has 35113(10.8%) population and 8456(10.6%) households. In this ward has high income group household's account for 12.2% and there are 43% mix (middle) type of households in this ward. While 17% of solid waste comes from high income group households. Whereas, middle income group households contribute 45.2%, considerable amount of solid waste of 37.5% comes from low income group households which account for 45% of the total households. It produces around 6,698kgs (5.1%) of solid waste and most of it is domestic solid waste. Solid waste composition of Hampinagar an upper middle class residential area consists 59% of wet waste within

the ward mixed waste produce in this ward account for about 38% and biomedical waste account for 3% solid waste in the form of dry waste (Biomedical waste) in the total domestic level solid waste.

HOSAHALLI :

Hosahalli ward is one such unit lies in between Vijayanagara proper in the north and Hampinagara in the south. Hosahalli has 0.9sqkm (10.7%) area and had 37,347(11.5%) population in (2011).It has about 9068(11.46) households. Provides high income group households closed to 60% of the total households in Hosahalli ward, middle income group 35% of the total households and 5.3% of low income group households. It produces around 9,229kgs (7.0%) of solid waste and most of it is domestic solid waste. Solid waste composition of Hosahalli ward has in its total solid waste of 16.7tpd, about 585 of wet waste and 38% of its total solid waste consist of mixed solid waste and this ward in its total solid waste also consist about 4% of its total solid waste as dry waste (Biomedical waste) in the total domestic level solid waste.

KEMPAPURAAGRAHARA :

Kempapuraagrahara is surrounded north and west by Binipet ward. To its West it has Vijayanagara ward to its south-west it has Binipete and very little possion of Rayapura (west).In terms of area Kempapuraagrahara has 0.4sqkm (4.7%) area with 40,032 (12.3%) population (2011). It had 10,051(12.7%) households. Categories of households by income in Kempapuraagrahara shows that middle income group household account for 53% of household. Followed by high income group household with 46% of household and low income household are just a 2% It produces around 1,0376kgs(7.9%) of solid waste and most of it is domestic solid waste. Solid waste composition of Kempapuraagrahara in its total solid waste of 16.5tpd it consist of 52% of wet waste,45% of mixed waste and 3% of dry waste in its total solid waste (Biomedical waste) in the total domestic level solid waste.

VIJAYANAGARA :

Vijayanagara forms an important ward in the Vijayanagara zone. Vijayanagara is given to much more border area in the south zone of BBMP. It has an area 0.7sqkm (8.3%) with the population of 40,331(12.4%). However, there were 11,938(8.0%) households in 2011.It produces around 10,477kgs (8.0%) of solid waste and most of it is domestic solid waste. There are 51% of households of high income group, 43% of mixed type of household and 6.1% of low income group household. Solid waste composition of Vijayanagara it is about 55% of solid waste, its wet waste about 42% of its mixed type of solid waste and 3% of its dry solid waste (Biomedical waste) in the total domestic level solid waste.

CONCLUSION WITH STRATEGIES.

Conclusion :

Current investigation on scenario of solid waste in Vijayanagara zone in Bangalore city-a case study has brought out ward wise generation of solid waste. In general the solid waste generated in this zone is predamnetly consist of domestic solid waste rather than other types of commercial, industrial and other types of solid waste. At present it produces around 127 tpd o solid waste. In this total of solid waste around 57 % is domestic solid waste.however, domestic waste also consists of 39 % of solid waste. This zone as limited commercial areas and one mall which account for 3.6% of dry waste solid waste. Vijayanagara zone below average performance of segregation of solid waste at source ward wise collected solid waste is compressed in special trucks (compactors) before shiftment to the land filling site at Chikanelamagala (45km) and Bellahalli (65km). Domestic waste which is wet in nature is segregation dumping sites manufacturing of compost.

STRATEGIES :

Present study has brought out an interesting observation that there are problems on both sides namely citizens as well as BBMP in solid waste management of this zone. On one hand citizens are yet to

take part fully in the segregation of solid waste at domestic level. As per the survey BBMP 2017-18 this zone less than 40% in solid waste segregation at source. There is a need to enhance the level of participation. This goes a long way in systematic utilization of solid waste either in manufacturing or dry waste recycling. Researcher while collecting data at various sources came to know that often BBMP officials are not actively participating in solid waste management. They must treat solid waste as a resource and whatever the area they are handling as their home environment rather than with present attitude of rather negligence.

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