RESEARCH REVIEW JOURNALS
Volume-04
Issue-07
July-2019

ISSN: 2455-3085 (Online)
RESEARCH REVIEW International Journal of Multidisciplinary
www.rrjournals.com[Peer Reviewed Journal]

Status and Development Initiatives taken in Solid Waste Management in Gangtok

Renuka Sharma

Research scholar, Department of Geography , Kumaun University, Nainital (India)

ARTICLE DETAILS

Article History
Published Online: 15 July 2019

Keywords
Population, Solid waste management, Municipal area.

***Corresponding Author**
Email: renukasharmask[at]gmail.com

ABSTRACT

Population growth and rapid industrialization growth has led to increase in production of municipal solid waste.

Tremendous increase of municipal waste in all the urban areas is suffering from serious health and environmental problem. In additional all the urban areas which are located in the hilly region of an area have seen an acute health problems in India. My paper is related to the problems of solid waste management, its status and improvements in Gangtok Municipal area.

1. Introduction

Materials which become useless after a short period of time such as newspaper, bottles, any plastics products, glass products and domestic waste is known as solid waste. All of these unwanted materials which are not in use in any form are called as Trash, Compost, Garbage, Solid Waste etc. Discarding, disposal and dumping of these waste needs proper and abundant space.

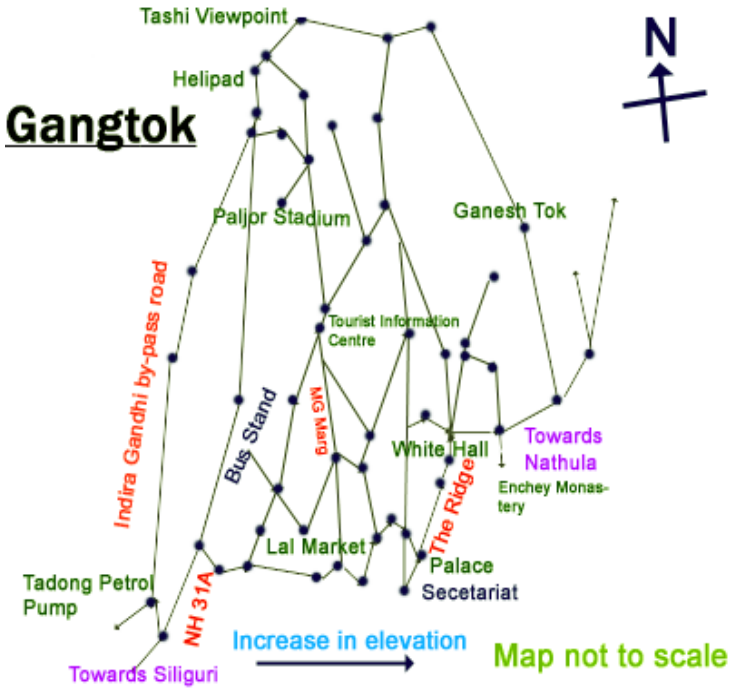
The environmental pollution caused by these solid wastes is rapidly increasing with the rapid rate of industrialization and urbanization. The huge quantities of solid waste produced by both of the developed and developing nations has become a serious problem.

2. The Study Area

Gangtok a capital of Sikkim is one of the largest town in the state, covering an area of 7.82sq/km, located in the eastern Himalayan Region of the Indian state with an elevation of 1650 m (5,410ft, with its total population of 100,000 belonging to different ethnicity communities of *Nepalese*, *Bhutias* and the *Lepchas*. Gangtok has become a tourist hub due to it beautiful location, and a pleasant climate all arora. Fund the year, attracting tourist from all around the world, Gangtok has become the center of Sikkim's tourism industry.

Gangtok covers an area from Tashi View Point the boundary runs eastwards along the valley side of Easter Bye Pass Road up to the ManeyJhora. From here the boundary continues upstream along ManeyJhora, along the P.H.E. Pipeline Road, the boundary runs along the ridge and down till the first turning then from there along the Hanuman Tok link road till 2nd mile Check Post. From the second mile check, post the boundary runs downhill diagonally till the DichilingJhora. From here the boundary continues downstream along the DichiingJhora toll 300 feet below the Rongnek Road (udhd.sikkim.org).

Figure 1.1



RRIJM 2015, All Rights Reserved

Table 1.1: Study Area

1.	FORMED	IN MAY 2010
2.	POPULATION POPULATION	1,00,286 (CENSUS (CENSUS 2011)
3.	AREA	19.016 SQ. KM
4.	MUNICIPAL WARDS	17
5.	BOUNDARY	TASHI VIEW POINT UPTO RANIPOOL
6.	GMC IS ONE OF THE YOUNGEST & SMALLEST CORPORATION IN INDIA	

3. GMS is one of the minutest and newest corporation in India

India is the second largest populated nation in the world. Population of over 1.12 billion according to Census of India 2011 that is nearly 17.5 per cent from the world's population. and has around 24 per cent of the world land area.

Moreover the growth of urban population on India is at a much faster than the growth of rural population. Besides increase in population, a notable increase in GDP leads to further increase in waste problem (Marvopoulous2011). According to the status report of MSW by (CPCB,2012). India generates about 127.49 million tons of MSW a day, making it sixth largest MSW generating country in the world (Ramanathan. S. 2014)

Solid Waste Management in India, traditionally amongst the urban development is the most ignored area which accounts most of environmental and health issues since past and in the present too, resulting in many issues related to health, sanitation and other environmental problems. In India the factors for the poor function of solid waste management is because of lack of financial resources, institutional weakness and inappropriate choice of technology.

In fact, in India collection of waste is very poor in small and medium towns. Scatter garbage and litter everywhere in and around the cities and towns makes it look congested and unhealthy, more than half of the waste produced remains scattered causing infectious and parasitic outbreak.

4. Initiatives taken in solid waste management

The proper management of solid waste comprises collection of waste materials and their proper disposal is suitable dump site and incineration. The first step that we need to take is the proper collection of waste followed by management of waste through appropriate, technical and scientific handling of the collected waste.

- **Prime Collection and Storage**

Street sweeping and street side collection are common methods of primary collection in India. Door to door to collection of waste is one of the major practices still practiced in most of the towns and cities. Private waste collectors are also involved in many towns and cities in door to door collection of the waste.

Throwing of waste either on the street side or in the dustbins located on the street sides are most common in many places of India.

- **Transportation**

Transportation vehicles in India include bullock carts, tractors, trucks and dumpers which are old and are not in a proper condition to be used. These old one's causes break down and disruption in services very often. Most of these vehicles has to be loaded manually without any mechanical techniques.

- **Treatment and Disposal**

In India the most common method of treatment and disposal of waste is done by composting of waste mechanically and vermin- composting. Though Palletization plants also exist in some cities but this form of waste treatment has not been widely used yet. With public-private partnership efforts, waste to energy plants is also being planned in some cities.

In most of the cities and town disposal of wastes is done in open dumping waste is dumped in low lying areas or on the roadsides as landfill sites are not available in many of the urban areas. Efforts to involve private sector NGOs, CBOs, etc, have made by the municipal government in order to improve the service.

5. Status of Solid Waste Management in Gangtok

Gangtok at present houses55.5% of the urban population pf Sikkim. This may be attributed to the disparities in the regional development pattern due to the rapid increase of population in a limited area. As per 2001 census the population of the town is only 29.54 within the notified town area but it is very apparent that the reasonable town boundaries which is applicable as per the GOS\4D and HD\6(70)294dated 23\11\04 is estimated to currently accommodate about 140,000 to 150,000 people.

Some features of the rapid urbanization are as follows:

1. At present Sikkim doesn't have a municipality or a local urban body that looks into the management of the town. The UD&HD and the PHED are the primary agencies responsible for the town development and management of core civic service.
2. There is an in adequate implementation of the building regulations that has led to regional imbalances in terms of civic infrastructure development.
3. Growth trends are estimated to continue concentrating on the major towns which will lead to aggravation of the imbalance in the already hard pressed civic facilities.
4. From December 2005, the government of India has launched a JNNURM program for the next seven years for the improvement and development of cities management. Gangtok is one of the 63 cities all over India selected for the mission program. Solid waste

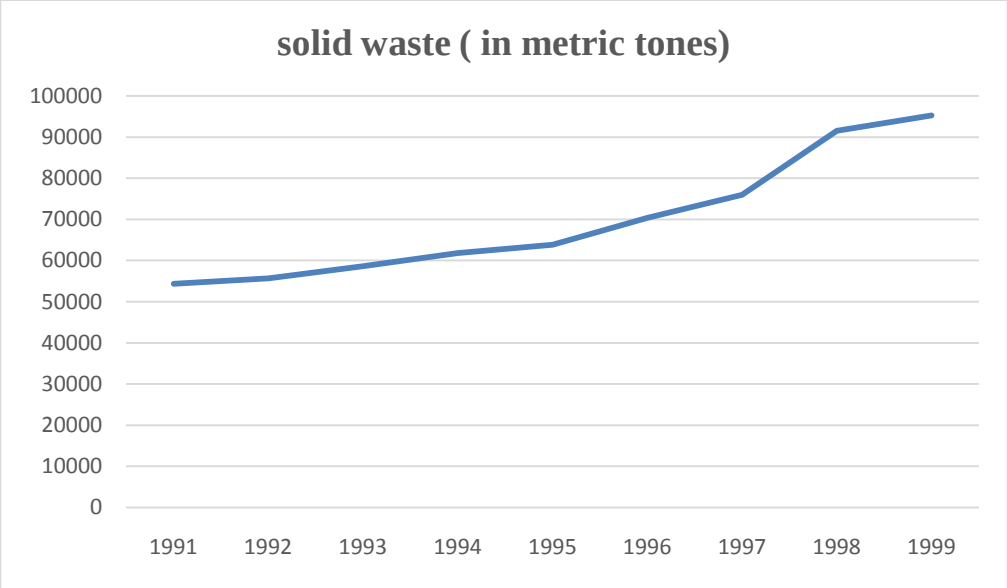
RRIJM 2015, All Rights Reserved

generation is directly linked to the population density. In small rural communities with very less population the domestic waste generated is engrossed by the nature itself through a natural system.

The percentage of degradable is usually higher in solid waste composition of the rural communities. Therefore, the problem of solid waste management system is touched in high densities populated areas and unmanaged growth of settlements in and around Gangtok. Whereas in the rural areas the problems of waste management are not stroked.

In an effective manner, the clue of eradicating the wastes in total is unrealistic and what is truthful is the management of solid waste. The areas having high population and rapid urbanization the management of solid waste has been a enormous challenge. Thus, this case study brings into the focus the seriousness of proper management of solid waste in Gangtok town.

FIGURE 1.2
GENERATION OF SOLID WASTES IN GANGTOK TOWN



Source: UDHD, Govt. of Sikkim

6. Generation of solid waste in Gangtok town

Waste which contribute as solid waste in Gangtok include house hold waste, marketable waste, building material waste, street waste etc. Approximately 45 metric Tonne per day (MT\day) is generated in Gangtok and its adjoining areas. The major source of waste generated in Gangtok is from domestic waste accounting 34.19% followed by commercial and institutional waste with 28.1% and19.2% respectively. 3.17% of wasted is accounted from the agricultural sector, only 0.12% and 15.22% respectively accounts in industrial and other waste. About 27,000 kg\day of total municipal waste is generated in Gangtok. According to the UD&HD the per capita generation of solid waste in Gangtok is 0.385 kg\day. Waste generated from house hold which includes kitchen waste such as vegetable waste, metals, plastics, bottles etc are the largest contributors. Other waste contributors include institutional waste, waste generated from schools, colleges, offices, banks, hospitals, religious places, which include left over foods, plastics, papersand even human excreta. Commercial waste from hotels and restaurants include food preparation waste like ashes, decayed, expired dairy products and rejected goods. Waste from dairies, hens farms, cattle farms and their excreta are the waste from agricultural sector. other biodegradable waste includes roadside tress leaves, branches etc.

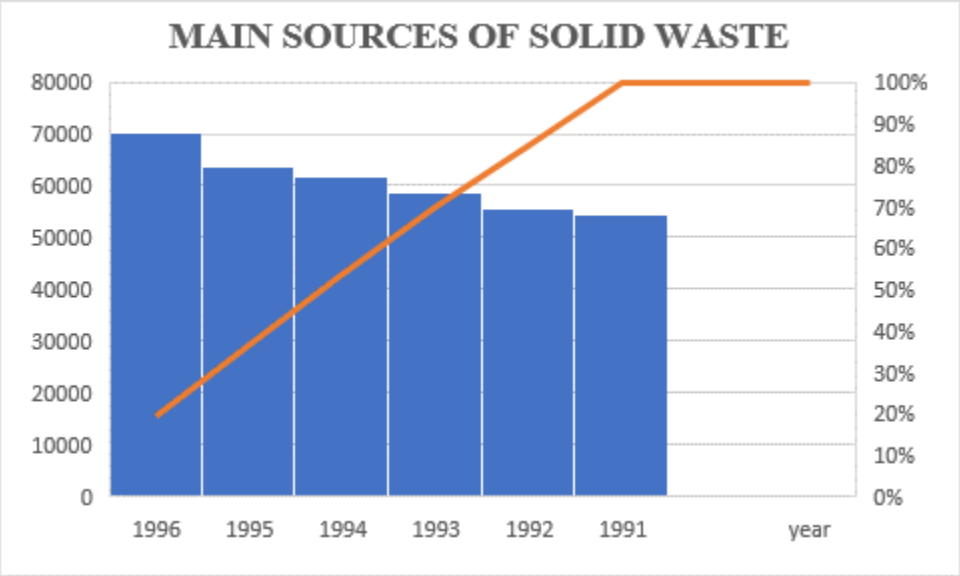
7. Current scenario of waste management in Gangtok

Currently the Public and Private partnership has been viable concept that has been appreciated in most quarters. Our organization is moving towards the treatment of waste, regulation of waste and to monitor the performance of certain program and that of the private sectors. NGOs and local communities have been encouraged by the organization to collect the waste from the households and transfer it to the transfer station.

Currently two such NGOs (1. Watson Committee, 2. Golden Circle) are engaged in collection of household waste in the designated areas. This has been a successful exercise to some extent and the department is looking at up the scaling such partnerships. Now the UD&HD department is poised to launch a more intense public participation and awareness program under the JNNURM (Jawaharlal Nehru Urban Renewal Mission) that will incorporate the principles of waste segregation and 3R's. Among the many features of the mission, waste management plays a very pivotal role in development and sustenance of Gangtok city. A compost plant at Martam 18km from the Gangtok city is designed to handle waste amoumting50MT\day which covers the entire segregated organic waste produced in Gangtok and its neighboring areas. However, the landfill area that is designed to last for 15 to 20 years may not last that long.

RRIJM 2015, All Rights Reserved

FIGURE 1.3



Source: Urban Development and Housing Dept. (UDHD)

Hence the principles of 3R and waste segregation are a mandatory for effective treatment of waste in the city. The ban on the use of polythene carry bags is another important decision taken by the State Government as on consequences of the enactment of the Sikkim Non- Biodegradable (control) Act-1997.

Banning the use of plastic bags by the shopkeepers and keeping two separate bins for biodegradable and nonbiodegradable in their shop premises was the new rule amended to the shopkeepers under Sikkim Trade License and Miscellaneous Provisional Rules, 1985. A fine of Rs5000 and imprisonment uptosix (6) months are levied as penalties for throwing the garbage and spoils etc into the jhoras. With all these steps taken by the State Government and the corporation from the people our state became a plastic free state with clean nalas and jhoras.

Primary Collection

Collection and transportation system a Door to Door collection of households accessible by the waste pick up vans. Collection of waste from the inaccessible areas back packers manually up to the road where the pickup vans will collect the waste. The pickup vans are specially designed covered waste collection vehicles that transport 500 to 600 kgs of waste. All pickup vans deliver the waste to the transfer station located in a convenient location. Tipping trucks of about 10MT load transports the waste from the transfer station to the waste management plant located 18kms away at Martam.

The state has taken all the efforts for the proper management of waste in corporation with UD&HD department Government of Sikkim. Dustbins have been placed along the roadsides at various points in Gangtok from which the waste is collected. The wastes are segregated into Bio-degradable and Non-biodegradable making it mandatory through municipal by laws for the citizens or other agencies concerned.

There are two bags green and red which signify degradable and non-biodegradable respectively. The practice of keeping dustbins in front of shops and houses are mandatory and to make it more convenient for the people even the Government has provided with dustbins to each and every household and to the shops as well.

Despite all the efforts taken by the State Government and other private agencies many localities have not been provided with the dustbins and these localities have no access to the waste collection hubs, due to which they dump their waste along the roadside, vacant land or into the jhoras creating a unpleasant environment in the municipality.

Even door to door collection of waste has been familiarized not only along the National Highway but has been stretched in and around the surrounding places of Gangtok like Sitchey, Development Area, Burtuketc on public request. Still some places are lagging behind due to shortage of garbage vehicles and men power.

Transportation

On the daily basics at a fixed time trucks are used to transport the waste from the collection sites to the dumping yard. Gantok alone has service of about 7 trucks which work on daily basics for the collection of waste in and around the town. All these seven trucks are designed as an open garbage trucks.

Dumping and Handling

Gangtok dumps all its collected waste in its dumping side located 18km away from the main town (Gangtok) which is situated in Martan on Nation Highway 31A. It is an open dumping site adjoining a local river known as Rani Khola.

Open dumping is the modest and low-cost method on waste **disposal** which only needs a huge scale of area to **dump**waste. Gangtok is still using this old method of dumping the waste in the open dumps, this method has been discarded by many nations worldwide as open dumps has a very adverse effect on the environment causing soil and water pollution, attracting many diseases, polluting environment with

RRIJM 2015, All Rights Reserved

its foul smell, giving birth to flies and making homes for stray dogs.

8. Conclusion

All the efforts taken by the government in cooperation with the NGOs and the local communities Sikkim waste management has improved a lot despite of all its flaws and drawbacks. Ban in use of polybags, prohibition of throwing non-biodegradable waste in any open space, nalas and jhoras, making the state a litter free, having a garbage bag in public transportation system, has added a golden feather in the cap. Adding up more garbage trucks, employing more of safaikarmacharies in each and every sector to check and clean the area has also helped a lot to make the area clean.

Strict rules and regulations and awareness amongst the people has changed the mind of the people. People are more concern about cleanliness and are doing their best to contribute in it.

References

[1]. Ahmad, I., Khan, J., &Naeem Ur Rehman, K. (2009). An Analysis of Willingness to Pay for Better Solid Waste Managment Services in Urban Areas of District Peshawar. SarhadJouranl of Agriculture, 25 (3), 529-535.

[2]. Ahtiainen, H. (2007). The Willingness to pay for reducing the harm from future oil spills in the Gulf of Finland- n application of the contingent valuation method. Discussion Papers n:o 18,. Department of Economics and Management, University of Helsinki.

[3]. Alhasaan, M., & Mohammed, J. (2013). Households' Demand for Better Solid Waste Disposal Services: Case Study of Four Communities in the New Juaben Municipality, Ghana. Journal of Sustainable Development, 6 (11), 16-25.

[4]. Altaf, M. A., &Deshazo, R. J. (1996). Household demand for improved Solid Waste Management: A Case Study of Gujranwala, Pakistan. World Development, 24 (5), 857868Eugine, T. (2008). Environmental Economics. Delhi: Vindra Publications (P) Ltd.

[5]. Central Public Health and Environmental Engineering Organisation(CPHEEO) ―Status of Water Supply, Sanitation and Solid Waste Management in Urban Areas‖, Sponsored by Ministry of Urban Development, Government of India, June 2005, pp xiv-xv.

[6]. Eurostat. (2009). The Environmental Goods and Services Sector: A Data Collection Handbook. European Commission.

[7]. National Solid Waste Association of India, ― Municipal solid waste‖, June 2010.

[8]. Sandra Cointreau, ―Occupational and environmental health issues of solid waste management: With special emphasis on middle and lower-income countries‖, Urban Papers, UP-2, The World Bank Group, Washington DC, July 2006, pp. 10-29.

[9]. Singh, J. (2010). Solid Waste Management at Community Level: Barriers and Solutions in Solid Waste Management in Present and Future Challenges. (J. Singh, & A. L. Ramanathan, Eds.) Published by: I.K. International Publishing House Pvt. Ltd., New Delhi.

[10]. World Health Organization, Urban Solid Waste Management. Published for the WHO Regional Office for Europe by Instituto per iRapportiInternazionali di Sanita, Firenze, Italy. 1993: pp. 134-138

RRIJM 2015, All Rights Reserved