

A Case Study on Municipal Solid Waste Management in Chandan Nagar City

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1. INTRODUCTION

Solid waste management is one among the fundamental and essential services provided by municipal authorities in the country to keep urban centers clean. Solid waste management has always been a serious problem for cities throughout the world. It is not different in developing countries like India. In certain regions of our country, the free disposal facilities have reached their own capacity and even local governments are confronted with difficult decisions. Modern civilization has brought a lot of luxuries and conveniences to our lives. However, with all of the amenities that modern life brings us, they also cause us to contribute to producing a large quantity of trash that needs to be taken care of. Fortunately, there's the field of **solid waste management**, and it is with that Solid Waste Management that modern lives are enjoyable without the disturbance or refuse. Solid waste management is an integral element of modern society. Even if we don't get to see what goes on at the facilities and plants that process and dispose of garbage, it still contributes to the well-being of our lives. There are many ways in which solid waste can be treated, and thanks to modernized practices and technological advancement, these methods are very safe and practical. In our present study we mainly confine our views on solid waste management of Chandannagore which is a semi-urban area of Hooghly district of West Bengal, India. This area is situated at the bank of river Ganga and therefore one of the most important environmental consequences of the process of Solid Waste Management (SWM) of this area is to protect this large river from uncollected or dumped garbage from where the waste is washed into water bodies, resulting to a negative impact on the environment. The poor quality of the services provided in terms of solid waste collection and disposal is the issues of concern.

2. CHANDANNAGORE AND SWM

Chandannagar is a semi-urban area located 30 kilometres (19 mi) north of Kolkata in West Bengal, India. It is head quarters of a subdivision in Hooghly district. Among the six municipal corporations in West Bengal it is one and some of its area is covered by Kolkata Municipal Corporation or KMDA jurisdiction. The total area is 20 square kilometers having a population of over 150,000. There are different views of the origin of name of Chandannagar. Some of them believe that the name was originated from the half-moon shape of the bank of river Ganga where this area is situated whereas some of them believe that it might have been taken from the flourishing trade and business of sandal wood (Bengali: *Chandan*) at that time. Besides that some of them believe that the name coming from the temple of Goddess "Chandi" which is situated at this area. This semi-urban area has been able to maintain its own identity as a French colony at the time of British India and thus earlier people knew the place by the name *Farasdanga* as it was a French colony (Bengali: *Farasi* means French, *danga* means land).

Chandannagar was established as a French colony in 1673, when the French obtained permission from Ibrahim Khan, the Nawab of Bengal, to establish a trading post on the right bank of the Hughli River. Bengal was then a province of the Mughal Empire. It became a permanent French settlement in 1688, and in 1730 Joseph François Dupleix was appointed governor of the city, during whose administration more than two thousand brick houses were erected in the town and a considerable maritime trade was carried on. For a time, Chandannagar was the main center for European commerce in Bengal.

In 1756 war broke out between France and Great Britain, and Colonel Robert Clive of the British East India Company and Admiral Charles Watson of the British Navy bombarded and captured Chandannagar on 23 March 1757. The town's fortifications and many houses were demolished thereafter, and Chandannagar's importance as a commercial center was eclipsed by that of Calcutta just downriver. Chandernagore was restored to the French in 1763,

but retaken by the British in 1794 in the Napoleonic Wars. The city was returned to France in 1816, along with a 3 sq mi (7.8 km²) enclave of surrounding territory. It was governed as part of French India until 1950, under the political control of the governor-general in Pondicherry. By 1900 the town's former commercial importance was gone, and it was little more than a quiet suburb of Calcutta, with a population of 25,000 (1901). The European town was noted for its clean wide thoroughfares, with many elegant residences along the riverbank. India became independent of Britain in 1947, and in June 1948 the French Government held a plebiscite which found that 97% of Chandannagar's residents wished to become part of India. In May 1950, the French allowed the Indian government to assume *de facto* control over Chandannagar, officially ceding the city to India on 2 February 1951. *De jure* transfer took place on 9 June 1952. On 2 October 1955 Chandannagar was integrated into West Bengal state.

Now Chandannagore subdivision is a subdivision of the Hooghly district in the state of West Bengal, India. It consists of Chandannagor municipal corporation and three municipalities (Bhadreswar, Champdani and Trakeswar) and three community development blocs: Haripal, Singur and Trakeswar. The three blocks contain 41 gram panchayats and one census town. The subdivision has its headquarters at Chandannagar.

For effective urban and environmental management, solid waste management plays an important role [2,3]. Current In India, municipal solid waste management, like most of other infrastructural services has come under great stress, consider low priority areas, solid waste management was never taken up seriously either by public or by concerned agency or authorities and now the large amount of waste is threatening our health, environment and well being (Chouhan and Reddy 1996, Mazumdar 1994) [4, 5,6 & 7]. Chandannagor Municipal Corporation is responsible for better management of solid waste that are produced everyday and the present study has been carried out in Chandannagor in the year 2011 to understand the problems and perspective associated with solid waste management in the semi-urban area.

3. MATERIALS AND METHODS

In our present study we concentrate on the area belongs to Chandannagor Municipal Corporation. The solid waste from the different area of society was collected, mixed and one Kg sample was prepared by using quartering method. The waste was then characterized and the percentage of each constituent was calculated. Secondary data regarding solid waste generation, collection system and disposal methods were collected from Chandannagor Municipal Corporation. Figure 1 show the concerned area which was considered in our study.



Figure 1: Area of Chandannagar depicted as study area

4. ANALYSIS AND DISCUSSIONS

Chandannagar Municipal Corporation is responsible for collection of solid waste which is produced day by day from different areas of Chandannagar. It is noted that there are five borough and 33 wards in Chandannagar. There are 35,630 houses in this area which was considered in our study. There are several sources for solid waste generation in this city which are as follows:

- i) Markets
- ii) Play Ground/ Parks
- iii) Domestic Buildings/ Houses
- iv) Houses containing shops
- v) Institutions

- vi) Offices/Bhawans/Complex
- vii) Hospitals

Following are the statistical information of producing solid waste (in kg) per day from different sectors:

Table 1

Area	No. of borough	No. of ward	No. of house hold	Population	No. of Market	No. of Hospital
22.03 km ²	5	33	35630	162187	7	2

Table 2

Serial No	Ward Number	Number of Market	Population
1	6	1	4688
2	8	1	7632
3	18	1	5453
4	21	1	5919
5	23	1	4202
6	30	1	4994
7	31	1	3321

It transpires from the above two tables:

- a) Garbage production from house is higher in ward number 26 among all wards as this ward is densely populated
- b) As seven wards are rich in market thus production of garbage from these wards are higher than rest of area
- c) Seven wards having market and two wards having hospitals produce higher amount of garbage than rest of wards

4.1 Garbage Collection Procedure

Chandannagor Municipal Corporation is responsible for collecting the garbage from different areas of Chandannagar. Municipal Authority is collecting this garbage in regular manner. There are numbers of big dust bins in several areas of the city and several wards share each big dust bins. Garbage is accumulated in this bin from adjacent areas. In each block three sweepers are working. For garbage collection procedure, 250 persons are involved. They are involving in sweeping the roads and collecting the garbage and transferring the waste into the bins. The collection of waste from these dust bins is frequently done where numbers of sweepers involved are more. The collected garbage is carried by small cart, tractors or trucks which are dedicated for collection purpose.

4.2 Transportation of garbage

Collected garbage is transported to the disposal areas in specific manner. It starts from small dumper and ends into big dust bins. Among the collected garbage, both degradable and non-degradable wastes are present. It is alarming that several plastic products are dumped into the dust bins. Several types of vehicles are used for transporting garbage to disposal sites which are as follows:

- i) Tri cycle cart
- ii) Tractor

Three tri cycle carts are provided in each ward for collection of garbage from door to door. But in market area extra two tri cycle carts are provided. There are 22 tractors which are used for transporting garbage from different areas. The tractors carrying waste are not covered or partially covered during the journey and waste tends to spill on the roads. The loading and unloading of waste is done through manual as well as mechanical system.

4.3 Disposal of waste

Normally the collected garbage is disposed without treatment and recycling. So till now there is no recycling procedure of garbage according to the normal specification i.e. Municipal Solid Waste (Management & Handling) Rules 2000 of solid waste treatment.

5. CONCLUSIONS

The solid waste management in Chandannagar City appears to be inadequate and needs up gradation. The solid waste has to be disposed off scientifically through sanitary landfill and recyclable portion of the waste should be salvaged. Segregation of recyclable material would also lead to reduction in quantity of solid waste for final disposal. Higher priority needs to be assigned to the management of municipal solid waste by the local authority and a system approach needs to be adopted for optimizing the entire operation of SWM encompassing segregation at source, timely and proper collection, transportation routes and types of vehicles and development and proper operation of sanitary landfill site. The density of population along with number of offices and institutions are continuously increasing thus there should be effective management activity for managing the solid waste which is generated daily in Chandannagar area.

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