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## URBAN SUSTAINABILITY ISSUE OF SOLID WASTE MANAGEMENT-A CASE STUDY OF KOLKATA

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### **ABSTRACT:**

The migrating flocks of people from villages to cities, mostly being pulled by the lucrative lifestyles, has not only posed a threat to the urban scenario but also affected the environmental equilibrium. The massive urbanisation and huge population density arouses the major concerns for the city- solid waste management and sanitation. The Kolkata Municipal Corporation is the largest urban agglomeration of the state of West Bengal covering an area of 187.33 sq kms and is divided into 144 wards with 15 boroughs. General questionnaire regarding the awareness to waste management and disposal system was used among various respondents who were selected on the basis of a random sampling method. The objectives of the study are to identify the problems of the residents regarding open dump, to discuss the steps undertaken and to suggest measures towards sustainable waste management. Littering, visual disturbance and adverse health effects are mostly seen among the respondents. The health issues associated with landfills are mostly the prevalence of diarrhoea, cholera, occurrence of ringworms and dengue. Though a variety of actions has already been taken at the state level and planning is constantly being done, yet the loopholes of urban solid waste management continue in Kolkata. Producing less waste, reducing residual waste, recycling organic waste, separating municipal solid waste are all the options left for us for sustainable waste management.

**Keywords:** solid waste, improper management, health hazards, sustainability, recycling, reduction.

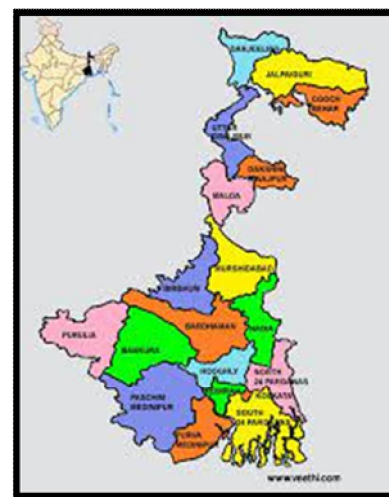
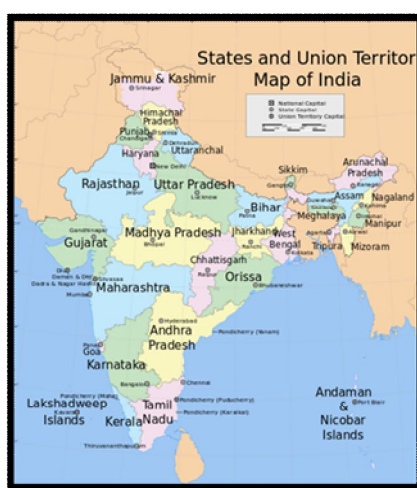
### **INTRODUCTION:**

Urbanisation has been one of the most talked about topic of the present century. The migrating flocks of people from villages to cities, mostly being

pulled by the lucrative lifestyles, has not only posed a threat to the urban scenario but also affected the environmental equilibrium. The massive urbanisation and huge population density arouses the major concerns for the city- solid waste management and sanitation. Diverse food habits and living standards produce heterogenous types of solid wastes which creates environmental pollution and health hazards for the urban dwellers. Nearly 36.5 million tonnes of waste are generated by Indian cities in a year. Kolkata produces 5372 tonnes of solid waste daily. Though 1900 tonnes of these are recyclables, yet actually 700 tonnes go for recycling and 1200 tonnes are left behind as untreated waste. Improper management of solid wastes like the landfill sites become the breeding ground of disease carrying bacteria, creates nausea and visual pollution to the passers-by and contamination of groundwater and surrounding land and soil. Thus, the issue of sustainability requires the proper management of solid waste in the city.

### STUDY AREA:

Kolkata is a prominent metropolitan city of India and is also the cultural hub of the country. Kolkata Municipal Corporation is bounded by river Hugli in the north west, the district of South 24 Parganas to the south and southwest, Salt Lake City to the north and North 24 Parganas district to the north. Situated towards the eastern part of India it extends from 22°28'N to 22°37'30" N latitude and from 88°17'30" E to 88° 25' E longitude. The Kolkata Municipal Corporation is the largest urban agglomeration of the state of West Bengal covering an area of 187.33 sq kms and is divided into 144 wards with 15 boroughs.





*Source: Internet*

## **MATERIALS AND METHODS:**

This consisted of collection of secondary information on physical and socio-economic aspects of Kolkata Municipal Corporation. Secondary data was collected from the Census, Corporation Reports and other books, websites and journals relating to the area under study. General questionnaire regarding the awareness to waste management and disposal system was used among various respondents who were selected on the basis of a random sampling method.

## **OBJECTIVES OF THE STUDY:**

The major objectives of the study are:

1. To discuss about the waste disposal problems
2. To analyze the health problems related to the issue
3. People's perception on the issue
4. Suggested remedial and alternative ways to the problem

## **THE CONCERNS REGARDING WASTE DISPOSAL:**

According to the guidelines of Swachh Bharat Mission, municipal wastes are segregated into three types at source- Wet Waste, Dry Waste and Repair and renovation Waste. Dry wastes consist of all non-biodegradable wastes like plastic,

paper and glass. The two major dumping sites in Kolkata are Dhapa dumping ground and Garden Reach Tranchie ground. However, KMC has transferred all the open storage to modern technique waste compactor stations. 100 of these compactor stations are working in Kolkata right now. Open dumping has largely been restricted in most parts of the city. Yet, the problem of landfill exists. The sources of solid waste generation in the city are-

- Markets
- Parks
- Buildings/ Houses
- Shops
- Shopping Malls
- Factories
- Offices
- Hospitals

The waste generation from houses, markets and shopping malls is highest in the city. The solid wastes from major markets like Manicktala, Gariahat, Baghajatin add to the gloomy scenario of the city. Previously, there were open bins or vats at different locations where the residents of the locality were supposed to throw the garbage. But the accumulation of garbage outside the vats created an unhygienic condition and visual pollution. Now, the sweepers collect the garbage going from door to door within the locality. The sweepers are provided with handcarts to collect garbage and brooms to clean the roads and lanes of the locality assigned. They transfer this garbage to the primary collection centres or compactors as well. Some of the non-biodegradable wastes end up in landfills of Dhapa and Garden Reach. Still open dumping systems are prevalent in many parts of the city like Garia, Shankar Ghosh Lane, Picnic Gardens, Teghoria, Park Circus, Belgachia and several others. In most of the areas surrounding the slums the open dumping of garbage is a regular feature. These are soaring to the eyes of the passers-by and spreads odour during monsoons and become the breeding grounds of mosquitoes and flies. These mostly include vegetable peels, medical wastes, e waste, sanitary wastes, glass bottles, plastic bags, broken plastic materials and regular domestic wastes. The

non-segregated wastes are mostly disposed in the open. The relationship between population density of the city and solid waste generation shows a strongly positive relationship.

### ANALYSIS OF THE FINDINGS:

A questionnaire study was conducted at various locations of Kolkata like Dhapa, Garden Reach, Garia, Shankar Ghosh Lane, Park Circus where people are more subject to open dumps.

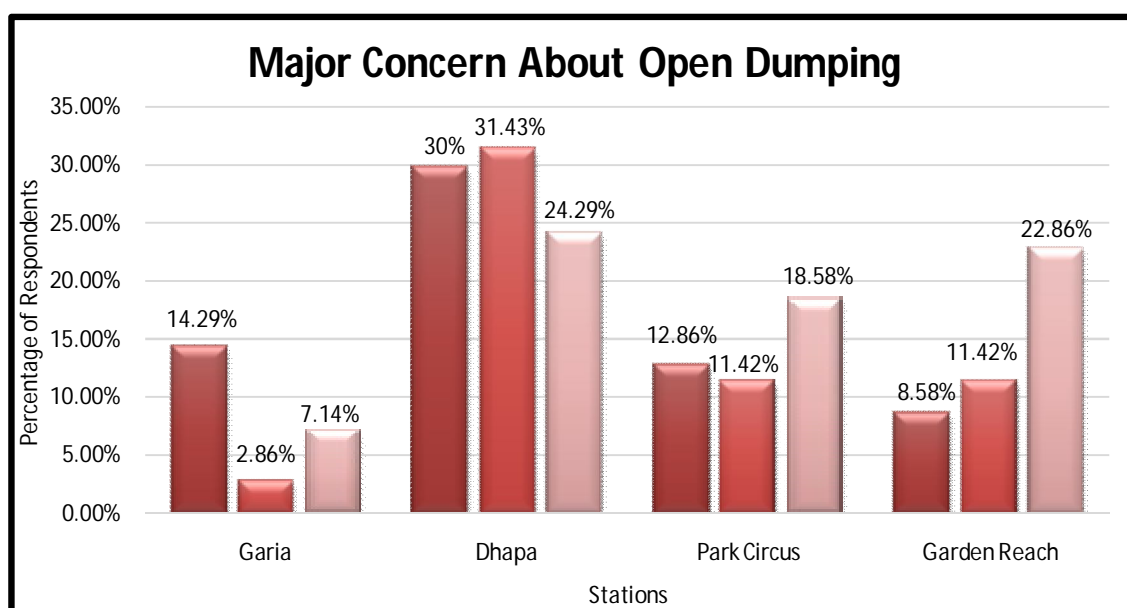
The questionnaire mostly pertains to the questions regarding the perception of the residents about open dumping, the health problems they are facing and suggestions from them. The distance between the houses of the residents and dumping sites were taken to be not more than 20 metres.

**Table 1: Major Concern about Open Dumping**

Stations	Number of Respondents	Littering	Visually Unappealing	Adverse Health Effects
Garia	15	10 (14.29%)	2(2.86%)	5(7.14%)
Dhapa	22	21(30%)	22(31.43%)	17(24.29%)
Park Circus	17	9(12.86%)	8 (11.42%)	13(18.58%)
Garden Reach	16	6(8.58%)	8 (11.42%)	16(22.86%)

Source: Primary Survey

**Fig 1**



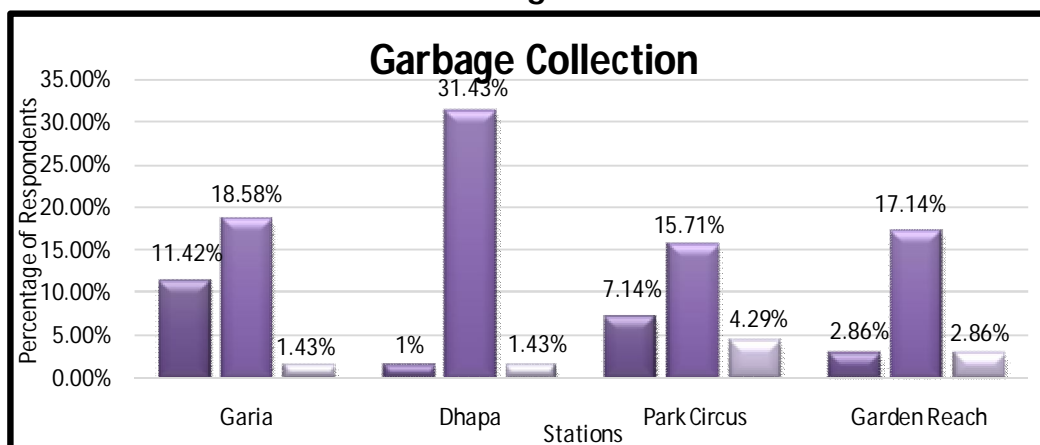
Source: Primary Survey

Table 2: Garbage Collection

Stations	Number of Respondents	Regular Garbage Collection (Yes)	Do people dump waste outside bins (Yes)	Do you rely on Private Collection System (Yes)
Garia	15	8(11.42%)	13(18.58%)	1(1.43%)
Dhapa	22	1(1.43%)	22(31.43%)	1(1.43%)
Park Circus	17	5(7.14%)	11(15.71%)	3(4.29%)
Garden Reach	16	2(2.86%)	12(17.14%)	2(2.86%)

Source: Primary Survey

Fig 2

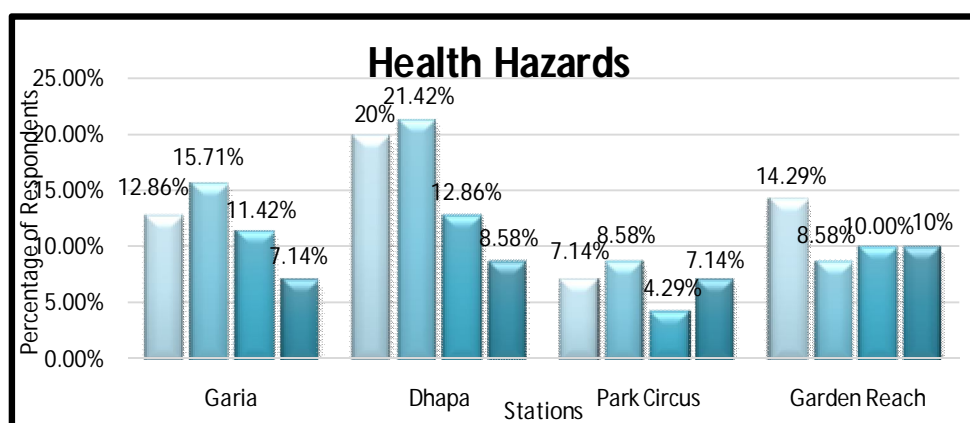


Source: Primary Survey

Table 3: Heath Issues

Stations	Number of Respondents	Diarrhoea	Dengue	Ringworm	Cholera
Garia	15	9(12.86%)	11(15.71%)	8(11.42%)	5(7.14%)
Dhapa	22	14(20%)	15(21.42%)	9(12.86%)	6(8.58%)
Park Circus	17	5(7.14%)	6(8.58%)	3(4.29%)	5(7.14%)
Garden Reach	16	10(14.29%)	6(8.58%)	7(10%)	7(10%)

Fig 3



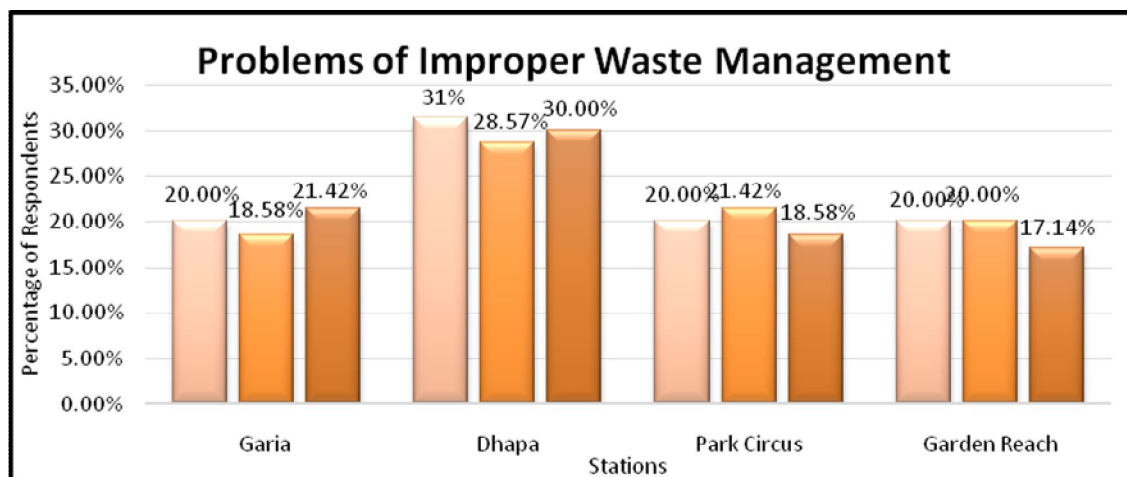
Source: Primary Survey

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**Table 4: Main Problems of Improper Waste Management System**

Stations	Number of Respondents	Pollution	Flies	Odour
Garia	15	14(20%)	13(18.58%)	15(21.42%)
Dhapa	22	22(31.43%)	20(28.57%)	21(30%)
Park Circus	17	14(20%)	15(21.42%)	13(18.58%)
Garden Reach	16	14(20%)	14(20%)	12(17.14%)

Source: Primary Survey

**Fig 4**

The questionnaire was set up considering the issues of waste collection, health hazards and major concerns of the residents of the stations chosen. Nearly 70 respondents participated in the survey. The responses towards the major concerns regarding open dumping suggested that the problem is immense for the residents of respective areas.

Figure 1 shows that the major concern of the residents around Dhapa, the open dumping ground of the city, is that the three parameters taken are fully operating here. Littering, visual disturbance and adverse health effects are mostly seen among the respondents. Park Circus and Garden Reach score high in these, but the problems are of smaller extent in Garia and better off than the other three places.

Figure 2 depicts the story of the process of garbage collection. Though it is devised that garbage must be collected every day, yet in the stations noted there is a shortcoming on the part of the municipality duties. People thus resort to open dumping but most of the garbage sits outside the bins and create nuisance in the localities. Very few of the respondents depend on private systems of

garbage collection as they are costly. A lack of consciousness is also responsible for such a scenario, the maximum scores in Dhapa again.

Figure 3 covers the health issues associated with landfills, mostly the prevalence of diarrhoea, cholera, occurrence of ringworms and dengue. Dengue is prevalent in Garia, Dhapa, Park Circus but diarrhoea is mostly common among the residents of Garden Reach. Cholera is most evenly found among the residents of the selected stations with a maximum occurrence in Garden Reach.

Figure 4 shows that improper waste management creates a multitude of problems like air pollution, soil pollution, surface water and groundwater pollution through leaching. Nausea is a general tendency of most of the respondents evoked due to the odour of the landfills. The problems are quite acute in Dhapa, Park Circus and Garden Reach with Garia a little behind.

#### **DISCUSSION:**

The above depicted data and analysis of the data helped to locate the problems of solid waste management system. These neighbourhoods generate a good amount of solid waste everyday whose disposal is not well thought of. The non-segregated wastes include bio degradable and non-biodegradable wastes. Plastic waste, glass waste, bio waste are all mixed up in the landfills. The mountains of rubbish from the city daily reaches Dhapa where people stride to live with earning livelihoods from being ragpickers, scrap dealers, picking wastes and recycling. These people are at great threat as they are constantly exposed to all levels of pollution. Even though people live there, the flies and constant bad odour troubles them a lot. Many workers near landfill sites are subjected to deadly diseases. Living conditions in most of these areas are cramped and unhygienic. The use of plastic bags has been restricted by the regulations of the Municipal Corporation. However, people continue to use them and dump garbage in them which creates more of plastic pollution. Various health problems are also pertinent to the stations which have already been highlighted. Apart from that, malaria, respiratory diseases, skin diseases are also common. The constant foul smell makes the quality of life miserable. The current situation is dissatisfactory for the local people. Yet they have no choice but to continue living in those unhygienic conditions. The monsoons are hard to bear for them. According to the



Solid Waste Rules 2016, published by the Kolkata Municipal Corporation, the following steps were undertaken-

- 86% of the wards are having door to door garbage collection.
- The sweeping of roads daily has been initiated in all the wards.
- Waste segregation has started but in only a handful of wards (19%).
- Dumpers, Tippers and movable compactors are made prevalent in most localities.
- Micro planning organisations have been assigned for collection, transportation and segregation of waste.
- Centre for Environment and Education has been engaged for state level development of action plans.
- State level logo and slogan competitions are organised to enhance awareness among the citizens.
- Products from recycled waste and eco-friendly products are promoted.
- Approximately 4500 million tonnes of garbage are collected every day from KMC. Master plan for solid waste management has already been proposed in 2016 which is taking shape.
- 32 acres of land in South 24 Parganas has been identified for scientific waste treatment of Kolkata.
- Annual report to be submitted to KMC.
- Burning of waste has been prohibited.

#### **SUGGESTED MEASURES:**

Though a variety of actions has already been taken at the state level and planning is constantly being done, yet the loopholes of urban solid waste management continue in Kolkata. The measures which can be undertaken in near future may be-

- Door to door garbage collection does not envelope the whole city-loopholes exist. This should be regulated with pre-determined timing and scheduling for the whole of areas under the Kolkata Municipal Corporation. The absence of proper collection impels the citizens to throw garbage in the open. This in turn creates all types of pollution and degrades the quality of life.

- The municipal authorities should mobilise the public and spread awareness on the issue. Community participation is the most important step that can be taken towards waste management.
- The municipal authorities dump the solid wastes of the whole city in Dhapa and Garden Reach. Heaps of garbage are left in these areas without been covered by inert materials. This should be immediately taken care of. It creates a filth for the local residents and the city as a whole.
- The sweepers dedicated for street sweeping are appointed on ad hoc basis. Thus, there remains a gap between what is there in the action plan and what is actually been done. It should be monitored strictly whether all the streets and lanes are cleared daily or not.
- Waste can be refined as compost or energy and can be recycled. Our views on waste needs to be changed- then only we can think of proper waste management. In India, waste is seen as filthy leftovers whereas it can be recycled and used properly.
- The aesthetic value of the citizens is much disturbed due to this problem. The open dumps and landfills create visual pollution which has become a part of the urban hazard. This must be taken care of by the authorities.
- Reduce, reuse, repair, rot and recycle are the five principles of waste management that should be taken up in a priority basis in Kolkata.

### **SUSTAINABLE WASTE MANAGEMENT:**

The broader part of circular economy is sustainable waste management. It is critical as it contributes to a flourishing natural environment, flora, fauna and the ecosystem. Proper waste management can free the land from being used only as landfill, has huge potential of energy production, reduces pollution and conserve natural resources. The main aim of sustainable development is the bright future of our planet so that it can sustain long. Thus, sustainable waste management is a circular model rather than a linear one. Here wastes return as a form of energy or recycled product and is not disposed of. Producing less waste, reducing residual waste, recycling organic waste, separating municipal solid waste are all the options left for us for sustainable waste management.

**CONCLUSION:**

The most threatening and serious problem of Kolkata has been the generation of immensely large quantities of waste. This is becoming difficult for the urban local bodies to manage. The lack of waste segregation at source, low levels of recycling facilities, lack of door-to-door collection facilities, low efficiency of waste transportation are the major areas of concern. There are various actions plans that are sorted out and instructed to be implemented, but a gap remains between actual plan and its implementation. Policies remain mostly in paper and not on the roads. Private sector cooperation can be sought for. The ward committees should play a vital part in waste segregation, collection and transportation. The sale of inorganic recyclables, compost and by products should be initiated. These will help to design the appropriate mixture of social, political, economic, environmental policies for today and tomorrow.

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