



SOLID WASTE MANAGEMENT—A WAY TO SUSTAINABLE DEVELOPMENT IN JALANDHAR CITY

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ABSTRACT

Urbanisation is the process of transforming rural settlement into urban settlements in the form of towns and cities. The growing cities of Punjab are facing many problems related to pollution, traffic congestion, housing, drinking water etc. Solid waste is generated in huge quantities daily by cities and the way to manage it properly is a major problem. Jalandhar City is no exception to it. Solid waste can be defined as the material that no longer has any value for the person who is responsible for it and it cannot be discharged through pipes. The residential area of the city contributes maximum in producing solid waste. The City has a population of about 862886 and an average 500 tonnes of solid waste per day is generated by the various sources like Residential Zone, Commercial Zone, Industrial Zone, Hospitals etc. The solid waste is collected by the Corporation Safai Sewak and by scavengers. There are many problems related to handling and disposing of Solid Waste in Jalandhar city. The collected solid waste is transported to dumping ground by truck dumper and tractor trolleys etc. Municipal Corporation has around 2016 workers deal with solid waste in the city. The dumping ground or collection centres are located within and outskirts of the city. The disposal of solid waste involves two methods, first is land filling method and second is waste sanitization treatment. Both these techniques are not effectively used by MCJ in the city to project the city as neat and clean. Jalandhar city is included in the list of smart cities under the ministry of urban development, Government of India. Now it is essential to manage the solid waste to move along the path of sustainable development for the future generations.

KEYWORDS :

INTRODUCTION

India's population in cities and urban areas has increased to 37.7% by 2011 from 14% at the time of Independence. By 2021 over 41% of Indians are expected to reside in urban area. Owing to increasing urbanization, cities are facing problems like pollution, housing, sanitation and solid waste management.

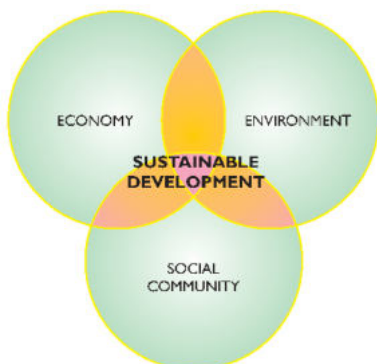
Solid waste management is the problem in all the cities of India, as well as throughout metro cities of the world. In India Per capita waste generation is increasing by 1.3% per annum. There is 5% yearly increase in waste generation and India produces 42.0 million tonnes of municipal solid waste annually. At present per capita generation of waste varies from 200 gm to 600 gm per capita/day. Collection efficiency ranges between 50% to 90% of the solid waste generated.

DEFINITION OF SUSTAINABLE DEVELOPMENT

Sustainable development is the development that meets the needs of the present without compromising the ability of future generation to meet their own needs.

G.H. BRUNDTLAND (1987) define it as.

It means progressive development based on the present needs and the needs for the future generations with rationale use of natural resources without damaging the environment.



DEFINITION OF SOLID WASTE

It is generally said that, "Any unwanted or discarded material that is not a liquid or gas."

According to Modern Dictionary of Geography. "Solid waste is a waste type that includes predominantly household waste with sometimes the addition of commercial wastes collected by municipality with a given area."

According to WHO, "Waste is defined or every substance or object arising from human or animal activation that has to be discarded as useless or unwanted."

Urban solid wastes consist of household waste, construction and demolition debris, sanitation residues, industrial and hospital wastes. In brief: SW can defined as the material that no longer has any value to the person who is responsible for it and is not intended to be discharge through a pipe. It does not normally include human excreta.

Sustainable Development and Solid Waste Management:

Efficient solid waste management is one aspect that leads to sustainable development. Solid waste management helps in maintaining the ecological balance of cities. Solid waste management brings economic benefits to urban population. It improves the aesthetic values of the city. It helps in bringing social awareness and harmony with other creatures of the urban centres. Sustainable development is directly influenced by the handling of solid waste generated within the urban centre. In Punjab all 167 Municipal Bodies generating 4634.48 tonnes /per day.

CATEGORIES OF WASTES:

Solid waste can be classified as follow.

- **Solid waste:** Vegetable waste, kitchen waste, household waste etc.
- **E-waste:** discarded electronic devices like computer, T.V, Music System etc.
- **Liquid waste:** Water used for different industries e.g. tanneries, distilleries, thermal power plant etc.
- **Plastic waste:** Plastic bags, bottles, buckets etc.

- **Metal waste:** unused metal sheet, metal scraps etc.
- **Nuclear waste:** Unused materials from nuclear power plants.

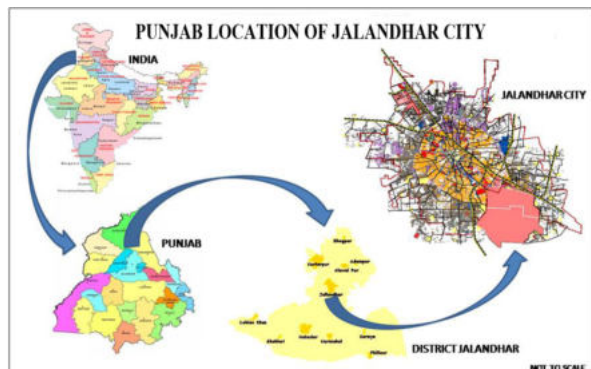
NECESSITY OF MANAGING SOLID WASTE:

Due to following problems there is urgent need to have proper management plans.

It creates foul smell in the area. Rats, flies and other vermin proliferate considerably. This unprecedented increase encourage growth of organisms which become carrier of various diseases. Besides, both surface and underground water gets contaminated. It scars the land and preempt open space. It gives ugly look to the urban areas. Further, it encourages the movement of stray birds and animals like eagles and crows.

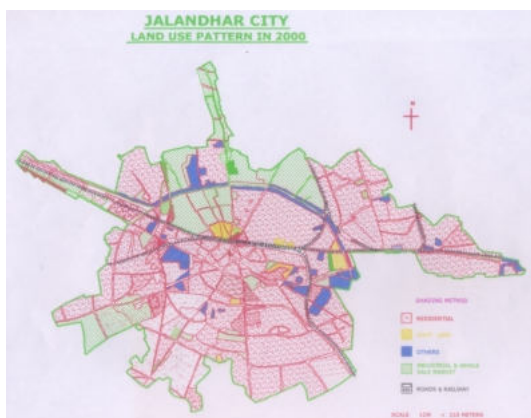
INTRODUCTION TO STUDY AREA JALANDHAR CITY:

Jalandhar is situated at 31.33' N and 75.58' E, It is at a distance of 146 km from state capital Chandigarh. It is centrally located in the Bist Doab with an average height 229 m above MSL. Jalandhar is named after Jalandhar, a demon king, who lived in water. It has total population 862886 with a corporation limit. City has area of about 110.43 sq. km. Jalandhar was the capital of Punjab after independence 1947 to 1953. It is one of the biggest manufacturer of leather, sports, surgical tools, printing industries and having maximum hospital in Asia.



SOLID WASTE GENERATING SOURCES OF JALANDHAR CITY:

City is having different types of land uses. It is residential, commercial, industrial, circulation, educational, mixed, etc. Each land use is actually a source of solid waste generation. The following map of Jalandhar clearly shows the different types of land uses.



TYPES OF SOLID WASTE GENERATED IN THE JALANDHAR CITY:

Generation rate varies from activity to activity. The average waste generated in Jalandhar City is 500 metric tonne per day. There are about 320 garbage bins in total which have been placed at different points in the city. The solid waste generated

in the city can be classified into different types and its percentage has represented in the following table. In this table maximum 85% waste comes under the category of non-hazardous. Similarly 10% is infectious waste.

Table 1.1 : Jalandhar city : Type of waste with Percentage

S.no	Type of waste	Share in Percentage
1	Non-Hazardous	85%
2	Infectious	10%
3	Non-infectious	5%
	Total percentage	100%

Source : Municipal Corporation of Jalandhar

HANDLING OF SOLID WASTE

For this purpose, MC Jalandhar has human force as well as vehicles for transportation of solid waste. The following table shows the vehicle strength available to Municipal Corporation, Jalandhar city. It is very meager and not sufficient to transport the produced city waste.

Table 1.2 : Total transportation fleet deployed in management of solid waste

S. no.	Name of Machinery	No. of Machinery
1	Tipper	20
2	JC/loaders	09
3	Chain Bulldozer	02
4	Three-wheelers	27
5	Tata Ace/ Bolero/ Ashoka Leyland	20
6	Tractor Trolleys including Hired	11 + 16
7	Compactors	03
8	Dumper placer	09
9	Bins 3.5 Cu M	62
10	Road side Single hangers bins	500
11	Road side Twins hangers bins	100
12	Smart bins (2 Cu M)	06

Source : MCJ

ORGANIZATION SETUP WITH THE NUMBER OF EMPLOYEES (MCJ)

Like the small number of vehicles, there is also shortage of work force with MCJ. It has only about 2016 employees for managing the solid waste in the city.

Table 1.3 : workforce deployed in SWM Plan

S.No	Designation	Total numbers of employees
1	Health officer	1
2	Chief sanitary inspector	2
3	Sanitary inspector	4
4	Safai workers (regular/ contract/ out sourced)	1942
5	Drivers	67
	Total	2016

Source : MCJ

COLLECTION OF SOLID WASTE

Solid waste is collected by using hand driven carts. The pullers collect waste from door to door. Thereafter the collected waste is transported to storage places within the city. There are as many as seventy secondary dumping sites which are handling the solid waste of the entire city. The sites are located near D.A.V. College, Trinity College, Pucca Bagh, Nakodar Chowk, Near Housing Board Colony etc. However, these dumping sites create problems like nuisance and health hazards to the local residents. Stray animals like pigs, dogs, cows further aggravate the problem of spreading and littering of solid waste. Unfortunately the collected waste is not segregated. Waste is also collected by Rag pickers/ Scavengers.

TRANSPORTATION OF SOLID WASTE

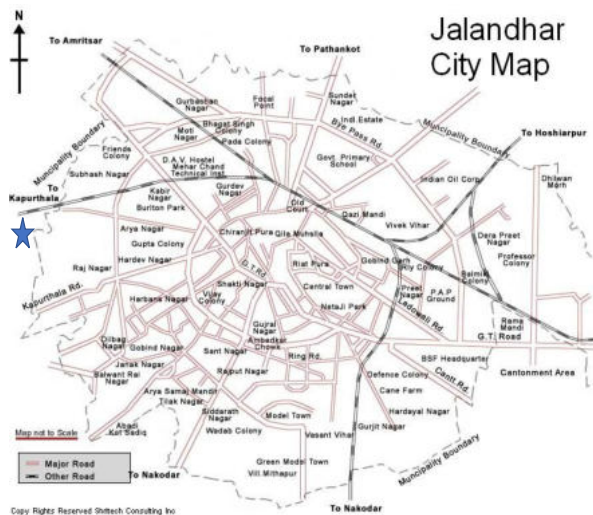
Transportation means "transfer of SW from the storage place

to the dumping ground. For this purpose, vehicles are used for transferring it to the main site. Dumping site at Wariana and Basti Bawa Khel site. Transport includes trucks, tippers, trolleys etc.

WARIANA SITE

- This dumping site is located near Wariana Village on Jalandhar-Kapurthala Road about 6 kms.
- MCJ and Punjab Grow More Fertilizers Ltd. These companies have signed an MoU.
- SW is converted into manure by the waste sanitization treatment method and composing process.
- This has 14 acres of land having a capacity of 600 TPD.
- Presently 100 TPD SW is transferred to this site because available land for dumping is less and secondly how to produce organic manure should be sold out.

LOCATION OF WARIANA DUMP SITE



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★ WARIANA

IMPACT OF SOLID WASTE

Storage places and dumping sites are having great impact on the citizen. Solid Waste is a major element of environmental pollution. It causes spread of many harmful diseases and infection diseases. Residents of Wariana village suffer from fever and 95% loose motions. Similarly, the residents of Pucca Bag suffer – 50% fever and 52% loose motions. It has led to foul Smell in various parts of the city.

These sites have become breeding ground for mosquito flies, rats Growth of Stray animals and birds. Consequently, vegetation /trees in the land filling areas get affected adversely.

RECOMMENDATIONS FOR EFFECTIVE MANAGEMENT OF SOLID WASTE

Solid waste should be disposed of properly. Waste can be minimized following 4R's principle. If we avoid water pollution, we can reduce amount of solid waste. The bio-degradable and non-biodegradable waste should be segregated. Public awareness can also play a key role. Health education can play here a key role. It will lead to proper collection of solid waste from various sites within the vicinity of the city.

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