

SOLID WASTE MANAGEMENT: PROBLEMS AND PROSPECTS OF INDIAN CITIES (A CASE STUDY OF JALANDHAR CITY)

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Abstract: Solid waste has increases at very rapid rate due to increase in population and urbanization. The population has reached at almost 7 billion, results in many health problems, disease such as malaria, diarrhea become more prominent. Solid waste is the unnecessary material that has no longer used by the people. Solid waste is also known as the third pollution of environment. It is generated from various sources like domestic waste, agricultural waste, industrial waste, sewage and biomedical waste. Solid waste is increasing day by day because of increase in population. Therefore, it has to be manage properly by the government and people. Solid waste management is the proper collection, handling and dumping of waste that has no longer used and which is discarded as unwanted material. Awareness among people would reduce the waste generation, controls health issues and maintain healthy and sustainable environmrnt.

Key Words: Solid waste (SW), Solid waste management, Urbanization, Municipal solid waste management (MSWM).

1. INTRODUCTION:

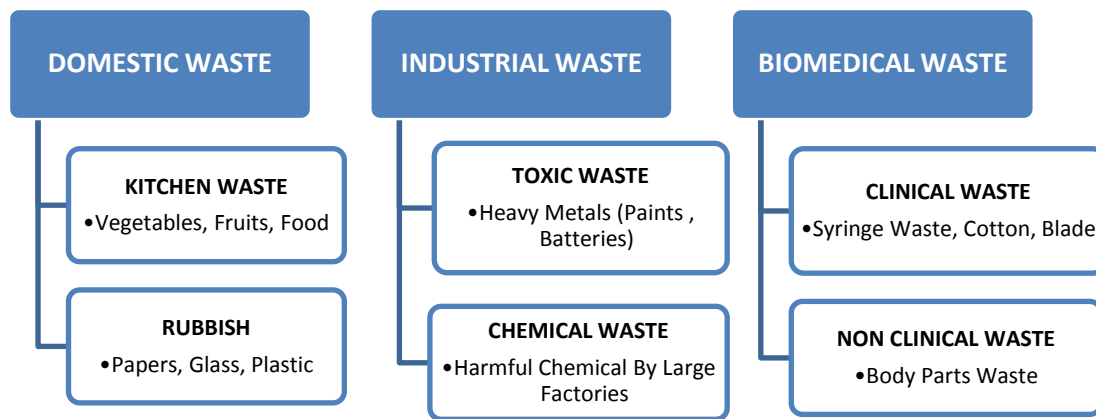
Urbanization becoming global phenomena today and the population is increasing day by day and waste produced by them is also on rise. Present study is confined to Jalandhar city because it is a fast developing city with population base of about 20 lakhs. Because of increase in population and some other factors there is a difficulty in managing solid waste and there is no sustainable way of solid waste management. As population increases rapidly the cities in the world are going to be urbanized. With the rise in the population the amount of solid waste is also increases which resulted in the large amount of solid waste which remain untreated and unmanaged and is responsible for lots of health issues and environmental problems. It became challenge to today's world and there is need of much awareness among people to fine immediate effective solutions.

Solid waste is the discarded material that has no longer used by the people. It is a material which arise from different human activities like use of fertilizers, pesticides etc. and which is normally not needed as useless and unwanted material. Solid waste is also known as the third pollution of environment which is one of the main troubles of our environment. Solid waste is generated from various sources like domestic waste, agricultural waste, industrial waste, sewage, biomedical waste. Solid waste is increases day by day because of increase in population. So it has to be managed properly by the government and people.

Today solid waste problem increases at very rapid rate due to increase in population and urbanization. The population is increases day by day and it is almost 7 billion. Many health problems, disease such as malaria, diarrhea which is very harmful to human health, the solid waste is affected not only the human life but also flora and fauna of any region. Solid waste is one of the major crisis, which is faced by all over the world.

Solid waste management is the collection of solid waste, processing or disposal of solid waste that has no longer used and which is discarded as the unwanted material. There should be proper management for the waste collection, transportation, processing or disposal of the solid waste by which they can decrease the problems generating because of solid waste. MSW refers to the waste that is arising from the domestic areas, commercial areas, industrial areas, and institutional areas in urban areas. Municipal solid waste consists of hazardous waste or non-hazardous

Figure 1: Types of waste



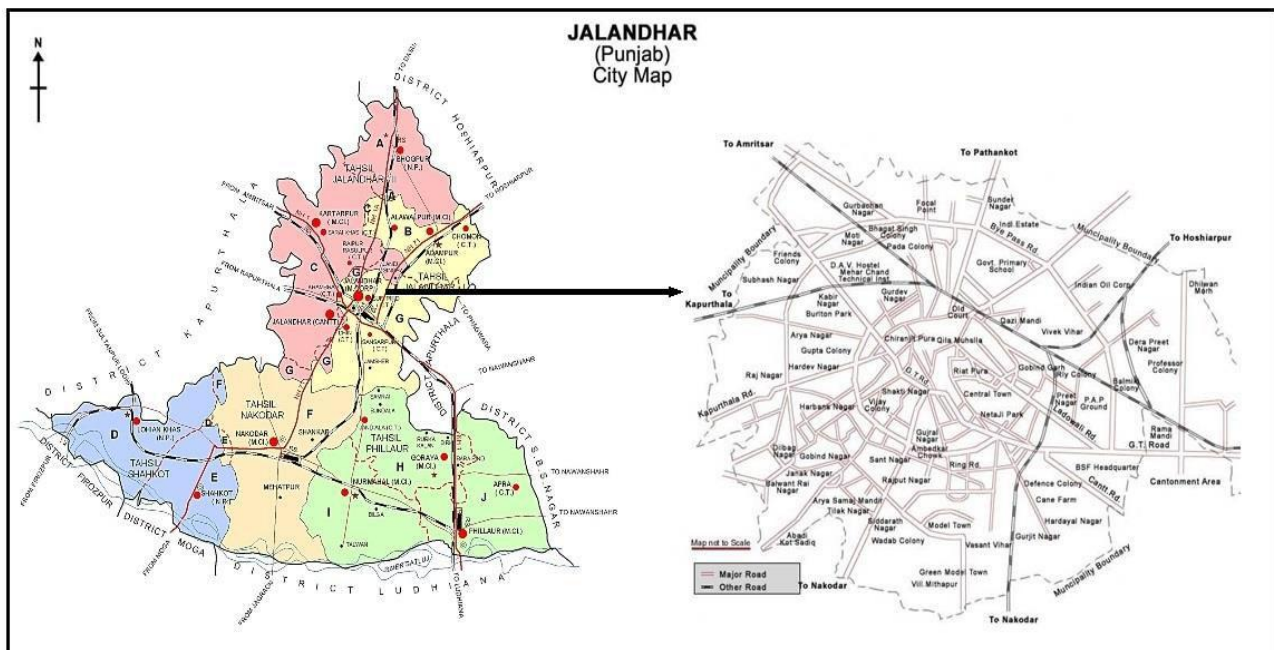
2. STUDY AREA:

Jalandhar, formally renowned as Jullundur in the British India, it is a city, which is situated in Doaba region of the northwestern state of Punjab. Jalandhar is the one of the oldest city in state of Punjab and oldest city in the country. It is located at latitude 31.3 and longitude 75.5. The total area of Jalandhar is 3401 sq km, its population is 2193590, and density of population is 831/sq km (census 2011).

Jalandhar is located along with the G.T road and well linked to rail and road junction. Nowadays Jalandhar is very well known all over the world for their sports good.

Total area of Jalandhar is about 3401 km sq. There are approx. 2.14 lakh houses in Jalandhar but only 1.50 lakh are houses, which are having the waste collection facility. The Everyday waste generation or production per house is around 1.5kg* (The Tribune Dec 2014) and the total number of waste produced or generated in Jalandhar city is 400 metrics /tons.

Figure 1.1 Map of Jalandhar City



2. OBJECTIVES:

- To identify the sources and type of waste produced in the city.
- To study how the solid waste has managed in Jalandhar city.
- To understand the problems generated by solid waste.
- To examine the impact of increasing population on the solid waste management.
- To analyze role of public sector and private sector in management of solid waste.

3. METHODOLOGY:

The research was done on the topic ‘solid waste management, problems and prospects of Indian cities’ (a case study of Jalandhar). There are 80 wards in the Jalandhar and the data is collected by both primary and secondary sources. primary data sources include questionnaire, face to face interaction and secondary data sources include data about solid waste in municipal corporations and through research paper. I collected data by using interviewing method and face-to-face interactions and also collected data by doing primary survey and also took some photographs of the different location in city where waste is collected or dumped. By looking at the photographs we can easily understand the situation of that area and by census 2011 we can get number of population increases in that particular area.

Status of Solid Waste Management in India

According to 2011 census, the population of India is increasing day by day and in the census 2011 the population of India is 1.2 billion and the 31% of the population lived in the city. In India, the urban local bodies do not have appropriate action plans for the enactment and execution of the waste. With the increases in the population both in the urban and rural area the waste produces by these populations is increases and the proper management of the solid waste become very difficult for the municipal authority. The municipal solid waste facing lots of problems not because of environmental and health concern but due to total quantities generated each day.

As per the information of central pollution control board around 1,27486 tons/day of municipal solid waste was produced and generated in India during 2011-12 and with an average SW generation of 0.11 kg/capita/day. Around 89,335 tons per day (70%) of municipal solid waste was collected and only 15,882 tpd (12.45%) was processed and treated of the total waste produced. Segregation of the waste from its sources, its collection, treatment, scientific disposal and transportation of waste was mainly unsatisfactory and it leads to of the surroundings environment, health issues and poor class quality of life.

Figure 2.1: Stages of waste disposal

At source	At community level	At transfer stations
Solid waste is stored at the source site until it is not picked up by the waste collector.	Community bins are used in market areas and crowd areas, which is common in developing countries. And of high rate of door to door collection many management authority of India introduced community bins.	Transfer stations are established because of economic reasons in many areas where there is a long distance to disposal sites. Smaller collection vehicles collected the waste from the source site and community bins and then they transport them to the disposal sites. And many transport stations are used as collection and sorting points for recycling materials.

In India, no city and no area can claim 100% of segregation of the waste at dwelling units and only 70% of waste is observed to be collected, while the left over 30% of waste is mixed and lost in the environment. Only 12.45% of waste out of total collected waste is scientifically processed and remain dumped in open (CPCB report, 2013cpcb. (2013).

Status of solid waste management in Jalandhar

Jalandhar is situated in the Doaba region of Punjab. Jalandhar is a sub urban area, and the population of Jalandhar region is around 20,00,000. The city is located almost 90 km from Amritsar and 375 km from Delhi. Jalandhar is well connected through roads and railways.

The spread of education, literature and language is responsible for the development of the Jalandhar. Jalandhar is known as the media center of Punjab and also known as the sports hub of Asia. Jalandhar is divided into 75 blocks and it is known for their sports goods all over the world. With the passage of time the population of Jalandhar is increase and with the enhancement in population of Jalandhar the solid waste generated from them is also increases. The management of solid waste is needed. Around millions of population is lived in the urban area of Jalandhar and same as lived in rural area around the Jalandhar city.

Why solid waste management is needed?

MSW is the waste which was generated by various human activities like domestic, industrial, commercial and etc. solid waste is discarded as a waste which has no further used by the people.

MSWM in simple terms refers to “managing of the waste properly”. Waste management are those activities and actions which is required to manage the solid waste from its commencement to its final dumping. solid waste management process includes various processes like collection of solid waste, transportation of solid waste, treatment of waste and proper disposal of that waste with monitoring and regulation. solid waste can be in any form like solid, liquid and gas. Mostly the solid waste management practices deal with the municipal solid waste management.

Why municipal solid waste management is needed in Jalandhar city?

As the number of people in Jalandhar is increase at very rapid rate and the solid waste which is generated by these generation is also increases. According to census 2011 the population of Jalandhar is almost 2193590 and the waste generated by them is approx. 400 tons. The solid waste management is done by the Municipal Corporation of Jalandhar.

Figure 2.2: Urban and Rural population of Jalandhar

	1971	1981	1991	2001	2011
URBAN	1017337	1121983	978850	1030717	1032417
RURAL	437164	612591	670355	931983	1161171
TOTAL	1454501	1734574	1649205	1962700	2193590

With population of more than 20 lakhs, Jalandhar is growing fast towards the development but this development has some negative impacts, which was in the form of solid waste management, there are 80 wards in Jalandhar and total waste generated from these wards is 400metric tones/capita and the waste generated from per house in Jalandhar is around 1.5 kg.

Figure 2.3: Dumping of waste in residential areas.



There are different types of solid waste which is generated by various activities of humans. In Jalandhar most of the waste is produced by the residential area and the municipal corporation of Jalandhar is responsible for the waste collection in Jalandhar.

Existing conditions of solid waste management in Jalandhar city?

During survey of Jalandhar city which included some wards of Jalandhar city i.e., jyoti chowk., rama mandi, fish market, football chowk, near bus stand. Most of areas are near to grand trunk road 703. As these areas are very crowdie and messy so there are lack of basic facilities to them. In these areas there is no proper arrangement for the disposal of waste and where there is availability of waste dumping the people are not utilizing it properly and people of these areas put the garbage of their homes on roads. This creates so much mess in these areas.

The waste generated by the Jalandhar city is of two types biodegradable and non-biodegradable which includes residential waste, commercial waste, agricultural waste, e-waste and biomedical waste. The municipal corporation of Jalandhar is responsible for the collection of solid waste and they have municipal solid waste management department for the collection and transportation of solid waste they are having sweepers and handcarts for the collection of solid waste from the different wards in Jalandhar city. The government garbage collector collects the garbage once a day in the morning. Other than that there are private garbage collectors hired by the shops and residential people for the waste collection. The collection of waste is done by the municipal solid waste management Jalandhar at two levels.

SWM

PRIMARY LEVEL FOR COLLECTING WASTE

SWM

SECONDARY LEVEL FOR HANDLING WASTE

The primary level is concerned with the collection of the waste and the secondary level is related to the disposal and handling of that waste. all the waste is collects by handcarts at primary level and then handcarts dump tat waste at the site and then all waste is transfer to the tippers for dumping.

After that with the help of JCB all waste is disposed at Waryana and after dumping of the waste the waste remains there without any disposal of that waste. But now the government of Punjab is planning to establish a bio magnification plant for the proper disposal of solid waste and proper discomposes of the waste.

Fig: 7 Condition of waste dumping sites on roads



Suggestion for the solid waste management

Solid waste management is the process by which sorted, treated, transported dispose. Residential waste is managed differently than biomedical and industrial waste. SWM is the proper disposal of waste that is generated by the industries, households, institutions, human settlements and other places where different activities of consumption and production.

SUGGESTIONS

Following are some suggestions for the solid waste management:

- Keep the footpaths, streets and other public places free from waste or garbage by using dustbins thus keeping the street clean and free from garbage.
- Placing the solid waste from residential to a proper location so that the all garbage dumped by the people can easily collect by the waste collector personally.
- Many people throw their old clothes into the garbage and clothes are those material which we cannot disposed and these created problem in management in solid waste instead of throwing the old clothes they can give it to someone who need this.
- We can reduce the food wasting. Every year a large quantity of purchased food is left uneaten instead of throwing the waste we can use if by donating it to the needy people.
- By eating healthy food, we don't require much disposable waste in packaging form. We can reuse old containers for storing food we can use old shopping bags.
- We can buy things, which have less packaging. So, there is less waste of resources for packaging.
- People can use the waste material into useful things like they can use water bottles for decoration, planting; newspapers for the paper meshi art, broken bangles for the hand and craftwork.
- People can get involved. People can visit the dumping site and recycling site and see how the waste is managed. People can talk to other people of other community about the solid waste management and how it benefits them.
- If one person starts to aware people about the solid waste, maybe other people will follow them and with this chain maybe the whole area, state aware about the solid waste which can help to secure the present and future without harming environment.
- Proper and effective management of the solid waste. There should be cost effective and new techniques for the management of the municipal solid waste.

- Jalandhar is a developing city and with the development of the city it's the responsibility of municipal corporation and authority to aware them about the solid waste management so they make the city clean and green and free from solid waste and problems generated by them.
- There should be some authority in the municipal corporation who can monitor the status of solid waste in the city or area of concern.
- There should be some plans for the diversion of waste in terms of sanitized and well-organized waste disposal and management of waste can provide remarkable solutions to all the solid waste problems. For the proper management of Municipal solid waste there should be different types of landfill sites and techniques.

CONCLUSIONS

Solid waste problem increases at very rapid rate due to increase in population and due to urbanization. The population is increases day by day and it is almost 7 billion. Many health problems, disease such as malaria, diarrhea which is very harmful to human health, the solid waste is affected not only the human life but also flora and fauna of any region solid waste is one of the major crisis which is faced by all over the world.

- There are 80 wards in Jalandhar and each ward have their waste collector for the collection of waste. After collecting waste, the waste collector disposes their waste in tippers and then with the help of JCB the waste is disposed at the Waryana which was the disposal site for the municipal solid waste.
- There is need arises to bring attitudinal shift from waste generation to waste management. By eating healthy food, we don't require much disposable waste in packaging form. We can reuse old containers for storing food we can use old shopping bags. We can buy things, which have less packaging. So, there is less waste of resources for packaging.
- There should be minimal use of plastic and non-biodegradables as around 30 to 40 percent of waste is generated from plastic and plastic are one of the harmful things, which can produce many harmful gasses at the time of burning.
- Segregation of household waste is required at level of its origin. Public awareness and training to convert household waste into compost making to be arranged.

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