RECENT TRENDS IN MUNICIPAL SOLID WASTE MANAGEMENT IN PATNA, A REVIEW

OPEN ACCESS

Volume: 3

Issue: Special

Month: May

Year: 2024

ISSN: 2583-7117

Published: 07.05.2024

Citation:

Dr. Kalpana Kumari1. "RECENT TRENDS IN MUNICIPAL SOLID WASTE MANAGEMENT IN PATNA, A REVIEW" International Journal of Innovations In Science Engineering And Management, vol. 3, Issue: Special, 2024, pp. 146–151.

Dr. Kalpana Kumari[1]

[1]Assistant Professor, Department of Economics St. Xavier's College of Management & Technology, Patna.

Abstract

Patna, the capital city of Bihar has registered considerable growth in recent years and a significant rise in population. Rising trends in the density of the population of the town; economic growth of the city; and increasing consumerism have led to the problem of increasing municipal solid waste generation in Patna. In the present scenario with rising trends of development and urbanisation, increased usage of electronic items and plastics has aggravated the problem of treatment of solid waste. Increasing waste generation is a serious issue, if it is not managed properly, it creates a serious threat to the environment, ecology and health of human beings. The present study attempts to analyse the status of waste generation and municipal solid waste management in the town. It attempts to examine the existing waste collection system and the waste disposal practices in the town. The study is based on secondary data. The paper analyses the challenges faced in the field of solid waste management and the prospects of opportunities that have not been explored yet in this area. The role of households and municipal corporations in Solid Waste Management is discussed. Based on the study made in Patna town suggestions are recommended for the betterment of the existing SWM system.

Keyword: Solid Waste Management, Households, Municipal Corporation.

1. INTRODUCTION

Patna town is the capital city of the State of Bihar. Due to significant economic growth registered by the State, increasing construction and a rise in the population increasing trends of urbanisation, there is a continuous increase in the municipal solid waste in the city. Municipal Solid Waste is the garbage discarded by people in their day-to-day life. As per the

Municipal Solid Waste Rules 2000, 'MSW includes commercial and residential wastes generated in municipal or notified areas in either solid or semi-solid form excluding industrial hazardous waste but including treated bio-medical wastes. Waste generation includes activities in which materials are identified as no longer being of value and are thrown away for disposal.' (Pandey, M.K, 2017)

The process of Municipal Solid Waste Management means that disposal of solid waste is done scientifically and systematically. It is done in various stages. In the first stage, there is waste collection at the primary source and the waste is segregated at the source and then it is stored then there is secondary waste storage and transportation then the waste is segregated at the secondary level and then there is a process of resource recovery from the waste, followed by processing and treatment of the waste and after that, the final disposal is done at the end.

Solid Waste Management plays a crucial role in maintaining a healthier and cleaner society. It helps in maintaining good hygiene, a better living environment, aesthetically cleaner surroundings cleaner water sources and healthy neighbourhoods.

On the other hand, if a community fails to manage its solid waste it may result in various kinds of diseases leading to poor health conditions for the people of the community and ecology as well. In each Municipality there is a Municipal Corporation who has the overall responsibility for SWM in their area. (Pandey, M.K., 2017)

Patna, one of the most populous cities of the State with a huge population of 1,683,200 as per the census of 2011 is well known as a major agricultural hub and a trade centre. The major items exported from this place are grain, medium-grained Patna rice, sesame, sugarcane, etc. During the last one and half decades Patna has registered sustained economic growth. This remarkable economic growth is due to the overall growth of the State with the introduction of Sushasan with the change in Governance. The city has shown trends of growth with the development of the fast-moving consumer goods industry, growth in the service sector and reverse migration. (Bihar Economic Survey, 2022-23).

As per the reports of the Census of India, RGI, GOI and Urban Development and Housing Department, the District-wise Trend of Urbanisation in Bihar is very high in Patna District with 44.3 percent which is the highest among the Districts of Bihar and much higher than the national average (Census Report, 2011 & UD&H Dept.).

The Patna Municipal Corporation (PMC) or Patna Nagar Nigam, is the civic body that governs Patna, the capital of Bihar. Patna Municipal Corporation administers the infrastructure of the city, public services, and supplies. PMC has an administrative area of 108.87 km. The Patna Municipal Corporation functions through an Empowered Standing Committee which consists of Ward Councillors including the Mayor and Deputy Mayor. There are 75 wards in the Patna Municipal Corporation and are controlled by six Circles. Each circle has one Executive Officer and is managed by one city manager appointed by the Bihar Government. (PMC)

1. **New Capital Circle**
2. **Patliputra Circle**
3. **Kankarbagh Circle**
4. **Bankipur Circle**
5. **Azimabad Circle**
6. **Patna City Circle**

Existing Solid Waste Management System and Practices in Patna

At present, the PMC is not following a systematic and scientific method of municipal solid waste management in Patna. The existing Solid Waste Management System and Practices followed in the municipal area are discussed below:

Waste Generation: At present 1000-1200 Tonnes Per Day (TDP) waste is generated every day, per head, waste generation is approx.450 gm to 600 gm per day. It was 1010 TPD in 2011. It has been estimated that in coming years, the amount of waste generation will be continuously rising with the increase in its population and the growth of the city. (Census Report, 2011 & UD&H Dept.)

Waste Generation in Patna Municipal Area

Year	**2011**	**2016**	**2021 (estimated)**	**2026 (estimated)**	**2031 (estimated)**	**2036 (estimated)**
Waste Generation in Patna	1010 TPD	1277TDP	1514 TDP	1836 TDP	2299 TDP	2570 TDP

Source: BUIDCO

Sources of Waste: Major sources of waste generation in the city are – Domestic Households, Restaurants and hotels, commercial establishments, agricultural markets, slaughterhouses, medical/nursing clinic waste, building construction /demolition waste, and industrial waste.

Composition of Waste in Patna Municipal Area

Composition of Waste	Domestic Waste	Industrial Waste
	60 %	40%

Source: BUIDCO

Composition of Solid Waste	Vegetable and Putrescible fractions	Combustible Fractions	Non-Combustible Fractions
	49%	12.5%	38.5%

Source: BUIDCO

Composition of waste: municipal waste comprises various categories of waste. 60 percent of the municipal waste of PMC falls in the category of industrial waste, whereas, 40 percent of the waste is comprised of domestic waste. The solid waste comprises vegetable and putrescible fractions (49%); combustible fractions (12.5%) and non-combustible fractions (38.5%). Various forms of waste disposed of in PMC are- food waste, commercial waste, industrial waste, construction waste, sanitation waste, recyclable wastes like- glass, metal, plastic, and paper; toxic materials like- consumed batteries, chemical paints, pesticides and medicines; soiled waste like- used disposable syringes, sanitary napkins; biodegradable compostable organic wastes like- peels of fruits and vegetable, leaves and food waste.

Waste Segregation at Source: At present waste segregation is not practiced in the city.

Primary Collection of Waste: After a rapid awareness campaign of Swachh Bharat Abhiyaan door-to-door collection of waste is practiced by the PMC and households are also participating actively in it. Now the city dwellers are not throwing the waste on the streets.

Street Sweeping is practiced regularly with the help of machines as well as manually.

Secondary Collection: For the collection of waste at the secondary source the municipality has fixed around 870 waste collection points, though many unauthorised waste collection points are also operational for waste collection in the city.

Transportation: Each circle in the city has one temporary intermediate point for waste collection. From these intermediated points the waste is transported to Ramchak Bairiya which is at a distance of around 22 kilometres from the main town. For transporting the waste, the PMC uses tractors, hiwaas, dumpers, tippers, etc. (https://www.pmc.bihar.gov.in)

Disposal: At present, the SWM in PMC is not done systematically and scientifically. There is a lack of proper infrastructure for treatment and safe disposal of collected waste. Waste collected from all 75 wards is finally dumped at the Ramchak Bairia site located on Gaya Road without any treatment. It is causing air pollution, water contamination, and releasing foul smell in the surrounding area causing health hazards to humans and ecology. There is an absence of a proper infrastructure for the final waste disposal at this place. A system of an Integrated Solid Waste Management Process has been started by the Bihar Urban Infrastructure Development Corporation Ltd. At this site. It was reported by the Government of Bihar, that the National Green Tribunal has charged the Bihar Government for their incapability to manage and dispose the solid and liquid waste. A heavy amount of Rs 4,000 crore has been imposed on the Bihar Government as environmental compensation. The order sheet highlights that around 5,437 tonnes per day of solid waste are produced by the State but only less than a fourth that is only 1,365 TDP is processed, leaving a huge gap between the production of waste and disposal of waste, which depicts a very alarming situation of waste management in the State. (https://www.pmc.bihar.gov.in)

2. RESEARCH METHODOLOGY

This research is based on secondary data that are collected mostly from government websites. The other sources for the data collected are reliable websites and journals.

3. HEAPS OF WASTE AT RAMCHAK BAIRIA SITE

Source: https://www.bhaskar.com

A land area of 80 acres at Ramchak Bairiya on the outskirts of the city is taken up by the Patna Municipal Corporation from the government for implementing a solid waste management system but unfortunately, so far the land area is used as a dumping ground. As is shown in the above picture the deposition of waste and garbage every day at this place has taken the shape of 20 to 25 feet high mountains. For more than a decade the PMC has not paid adequate attention to the waste disposal at this sight which has created a mountain of 12 lakh tonnes of waste and garbage. Around 1000 tonnes of fresh garbage is deposited every day besides the legacy waste at this place which is aggravating the problem continuously. (https://www.pmc.bihar.gov.in)

The Ramchak Bairiya dumping ground is creating innumerable health hazards for the people living in this area. The air is not healthy for breathing. The majority of the people who have earlier purchased land have built their houses but have left the place and decided not to reside there. In this area, only ragpickers prefer to live as they get a source of livelihood by picking up useful things from the heaps of garbage and waste. They are not aware of the fact that the environment in which they are living will create harm to their health. At times this dumping ground catches fire and generates poisonous gasses in the air, polluting the entire area. Water contamination, generation of methane gas, etc, is aggravating the persisting problem at this place.

At present two machines are used for waste disposal which manage 25 to 30 tonnes of waste every day. Adding 10 more machines in the process will enhance the waste disposal capacity to 250 to 300 tonnes per day. (https://www.pmc.bihar.gov.in)

As the Patna Municipal Corporation lagged in the cleanliness survey of Municipal Corporation, it initiated the process of solid waste management. Various methods for waste management have been started at Ramchak Bairiya. A total machine is deployed for the segregation of fresh garbage. Another machine is used for bio- mining for legacy waste disposal. Bio-degradable wet garbage is used to make compost. 13 different kinds of garbage are separated from the heaps of garbage like polythene, iron-tin, shoes, slippers, glass bottles, plastic bottles, etc. for the disposal of the dead bodies of birds and animals plant has been set to burn the dead bodies of animals and birds. For the disposal of medical waste Incinerator plant is established. For the disposal of plastic waste, a plastic waste processing plant is also planned to be set up by PMC in collaboration with the Central Institute of Petrochemical Engineering and Technology. (https://www.pmc.bihar.gov.in)

4. DISCUSSION

Patna is one the most populated cities of Bihar with a decadal growth rate of population (2001-2011) standing at 22.34 percent and a density of population of 1,102 persons /sq.km. as per reports of the Census 2011. (Census Report, 2011) Patna ranks very high based on solid waste generation as compared to other cities in India. The important factors contributing to the increasing rate of waste production in the city are- the increasing population growth rate, increasing rate of urbanisation, reverse migration due to improvement in the law and order conditions, economic growth of the city and increasing trends of consumerism. Though the rate of waste generation in the city is very high the positive aspect is that the major portion of the solid waste is organic and 13% of the total waste is recyclable. This kind of waste can be disposed of, or if it is managed properly but if it is not managed properly it can cause various kinds of diseases and generate various harmful effects to the health of humans and ecology.

It is observed that there has been a marked improvement in the behaviour of the people of the city after Swachh Bharat Abhiyaan since 2nd October 2018 a campaign for keeping the city clean by promoting door-to-door garbage collection. Every morning the garbage collector vehicle playing the song ‘gaari waala aaaya ghar se kachara nikaal’ has really made an impact on the city dwellers. It can be seen that people are not throwing garbage on the road or any other corner but they wait for the vehicle of the Municipal Corporation to deposit their garbage.

Though households and the PMC are actively participating in door-to-door garbage collection waste segregation is not practiced either by the households or by the PMC at the primary level.

With the recent technological development, there is extensive use of computers and electronic equipment by the people of the city and with the introduction of the upgraded new model of the equipment, the old model electronic gadgets and equipment are thrown away by the consumers which is causing a significant increase in the e-waste generation in the town is a matter of serious concern.

Medical waste generated by hospitals in the city is not treated scientifically and systematically before disposal. Medical waste is in the form of body fluids, bandages, swabs, syringes, etc. These kinds of wastes are highly infectious and harmful to the environment and human health if it is not disposed of systematically. Only one hospital in the town, Indira Gandhi Institute of Medical Sciences, IGIMS, is using a treatment plant for the scientific disposal of medical waste. Other hospitals and nursing homes are throwing their medical waste with general waste without any scientific treatment to be collected by the municipal corporation.

5. POLICY RECOMMENDATIONS/ SUGGESTIONS

There is a dire need to constitute an institute to study and estimate the amount of solid waste generated in the municipality's various categories of waste to devise a strategy for its proper and efficient management. There are various kinds of waste like- commercial and household waste, industrial waste which can be recycled, non-hazardous waste and hazardous waste generated from hospitals and health centres, reusable and non-reusable construction debris, etc.

Two important processes of SWM -Waste Collection and Waste Segregation should be given proper attention as it has a potential open-up market for the waste management sector. NGOs can play a significant role in involving citizens of the town in practicing waste management in a better way. (World Scientific News, 2017)

The Patna Municipal Corporation should be provided with adequate infrastructural facilities and upgraded technology for Solid Waste Management which require more expenditure as there is continuous and unplanned growth of the urban Patna. (Mufeed Sharholy et. al.)

There is a need to spread awareness among households about segregating waste into organic and inorganic waste. Electronic and print media can play a vital role in this awareness campaign. In the schools also the children should be sensitized to segregating waste.

Incentives can be provided to households in various ways. As the raddiwala purchases old newspapers and stationaries from the household; in a similar way incentives like, dustbins flower pots, etc can be provided to the households for segregating the waste.

Households can be educated to do composting at their homes. Elected ward councilors can play an important role in motivating the household to do such practices. There can be a creation of a common composting unit for the entire ward or colony There can be one ‘Model Ward’ which can implement the waste management practices with the cooperation of their people.

Awareness campaigns should be promoted towards the practice of 4R- Refuse, Reduce, Reuse, and Recycle. This means consuming fewer resources, developing a practice of reusing things as far as possible and recycling what cannot be reused. (European Scientific Journal June, 2015)

Single-use plastic should not be used, either by the sellers or by the households. Policymakers should be vigilant in restricting single-use plastic and should take immediate action when it is seen to be used.

The government should promote Start-up in the area of Solid Waste Management through granting loans at lower rates of interest and tax holidays.

6. CONCLUSION

Though there is a marked improvement in the Solid Waste Management practices in the city of Patna the pace of work needs to be accelerated in this area for a better result. The MSW rules should be strictly followed. Involvement of the public in solid waste management is very important. Government should ensure that the fundamental rights of the city dwellers are protected and the citizens should be motivated to perform their fundamental duties, it will of great help in practicing waste management with greater efficiency. (World Scientific News, 2017)

It was found that there is an urgent need to devise an improved framework with the incorporation of better technology in Solid Waste Management for Patna town, the capital city of Bihar. The plan should be implemented

effectively for the entire city. Public apathy should be altered by massive awareness campaigns with the help of print, electronic and social media and educational measures. Immediate actions are to be taken as the city is already a hotbed of many infectious and contagious diseases due to inefficiency in waste management. It requires households, Corporates, Municipal Corporations and Policymakers to come forward in cooperation and active participation in combating this critical problem of waste aggravation in our society so that we live our lives in a cleaner and healthier environment.

REFERENCES

[1]. Pandey, Kumar Manoj, Solid Waste Management in Patna World Bank Report, 2009

[2]. Bihar Economic Survey 2022-23, Finance Department, Government of Bihar Census of India, 2011, RGI, Government of India

[3]. Urban Development and Housing Department https://www.pmc.bihar.gov.in/about.aspxIntroduction

[4]. https://www.pmc.bihar.gov.in/SWMObjective.aspx

[5]. Bihar Urban Infrastructure Development Corporation Ltd. (BUIDCO)

[6]. http://timesofindia.indiatimes.com/articleshow/10002 2775.cms?utm_source=contentofinteres t&utm_medium=text&utm_campaign=cppst

[7]. https://www.bhaskar.com/local/bihar/patna/news/1- lakh-tonnes-of-waste-will-be-removed-in-1- year-2- thousand-tonnes-of-waste-disposal-will-be-done- daily-131375381.html

[8]. Bihar Economic Survey 2021-22, Finance Department, Government of Bihar

[9]. Nandan, Abhishek, Yadav Prasad Bikarama, Baksi Soumyadeep, Bose Debajyoti; Recent Scenario of Solid Waste Management in India, WSN 66 (2017) 56-74 EISSN 2392-2192

[10]. Municipal solid waste management in Indian cities- review

[11]. Mufeed Sharholy, Kafeel Ahmad, Gauhar Mahmood, R.C. Trivedi https://doi.org/10.1016/j.wasman.2007.02.008

[12]. European Scientific Journal June 2015 / SPECIAL/ edition ISSN: 1857 – 7881 (Print) e – Agarwal Raveesh, Chaudhary Mona, Singh Jayveer Waste Management Initiatives in India for Human Well Being ISSN 1857- 7431, pp1