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# AN ASSESSMENT OF SOLID WASTE MANAGEMENT (SWM) IN URBAN AREA OF ARA IN BHOJPUR DISTRICT

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**ABSTRACT**

*The present paper deals with the status of solid waste generation in urban area of Arah along with its ways of disposal and management. Management of solid waste is an issue of grave concern for this area as all the ponds, water bodies and water logged areas become the dumping site of DSW including huge amount of plastics. The data collected for total solid waste generation in the area is alarming and poses a huge problem. This problem needs immediate attention from all the agencies of government and NGOs to find out all possible ways of management to mitigate this problem.*

**KEY WORDS:** *Solid Waste Management (SWM) incinerator, sewage, Domestic Solid Waste (DSW), Industrial Solid Waste (ISW).*

## INTRODUCTION

Waste management is one of the most severe problem our world is facing today. Urbanization and population explosion have increased it more. This problem needs immediate attention from mass, media and govt. to come out with effective measures. Accumulation of wastes binds the creative energy , stopping its flow in biosphere. Immediate disposal and recycling is very important to maintain a continuous and undisturbed energy flow in Biome. However this paper touches a small aspect of Waste Management (WM) i.e. Solid Waste Management (SWM).

SWM stands for trash or garbage which are solid in nature. It includes all the discarded solid waste material from industrial, municipal, agricultural activities , household materials consisting of everyday materials , food and yard waste along with construction waste , biomedical waste, electronic waste and even study waste. The SWM includes entire process from collection of waste from their source and their disposal. It includes all processes like Transportation, Analysis, Legal procedures along with monitoring and enforcing regulations. There are a number of principles related to SWM but generally accepted fundamental concept of hierarchy of SWM includes five stages:-

1. Reduce- Changing our behaviour
2. Reuse- Reusing material
3. Recycle –Recycling and Reprocessing materials
4. Recover- Recovering energy

5. Landfills- Targeting zero landfill

Another aspect of SWM is to put stress on Waste Minimization by the public. The handling and disposal of solid waste vary in different parts of our country. Wastes have been classified into two types depending on their sources

I. Municipal Waste
II. Industrial Waste

I. **Municipal Solid Waste(MSW):-** It refers to all the waste and rubbish which are discarded by the public in everyday life. The composition of waste varies from Municipality to Municipality and changes significantly with time. It mainly consists of domestic wastes which can be separated into biodegradable and non biodegradable wastes. Biodegradable waste like food and kitchen waste, green waste, paper waste etc. are recyclable, therefore can be easily disposed. Non biodegradable waste like demolition and construction waste, dirt rocks, debris,, electrical and electronic waste like TVs, computer, light bulbs, mobile phones etc. are not recyclable. Hazardous waste materials like paints chemicals, tires, batteries, pesticides, herbicides, fungicides and biomedical wastes are included in this category of SWM.

II. **ISW:-** Refers to industrial solid waste which generally includes coal ash, waste from iron and steel plant, slog, phosphogypsum, red mud, waste sludge, residues etc. The major generators of industrial solid wastes are thermal power plants producing coal ash, Integrated Iron and steel mills producing blast furnace and steel melting slag, Non ferrous industries like aluminum, copper and zinc producing red mud and Sugar industries generating press mud, Pulp and paper industries producing lime and fertilizers and allied industries producing gypsum. Management of ISW wastes is not the responsibility of local bodies. Industries generating solid wastes have to manage such wastes by themselves and are required to seek authorization from respective pollution control boards under relevant rules. .

However through joint efforts of SPCBs, local bodies and industries, a mechanism could be evolved for better management. For arriving at an appropriate solution for better management of ISW assessment of nature of waste generation is also essential. Industries are required to collect and dispose their waste at specific disposal sites and such collection, treatment and disposal is required to be monitored by the concerned SPCBs and PCCs(Pollution Control Committee in states and union territories respectively).

In urban area of Ara, MSW is managed by Ara Municipal Corporation, which is not so efficient in managing the rapidly increasing piles of trashes and garbages in the city. As recent data from municipal corporation reveals that about 125 MTD was collected lifted and transported daily. But rapid urbanization has posed a lot of pressure on waste production. There is no garbage bins at most of the places. There are some garbage points where people dump waste. These places are not specified by AMC but these are randomly selected by people themselves. Mostly these places are by the road side, which creates problems for traffic. It creates bottle neck on the road where traffic slows down and creates traffic jam. Vacant and low land near the town is also used for throwing MSW, and are used as dumping ground. Nahar side area (Canal from Sone River flowing near Ara) has also been used widely as dumping ground for garbages collected by AMC workers. This is very dangerous polluting the nahar water also. So there is an immediate need to have steps from the government and AMC to look for an option for dumping ground and for the processing of MSW meant for zero waste technology target.

## WASTE MANAGEMENT DEFICIENCIES

### 1. *Segregation*

Presently, the waste is not segregated at the household level. The residents dump the waste in the nearby vacant land.

### 2. *Collection*

At present there is an inefficient collection services in place. House-to-house collection of solid waste is not in practice. The solid waste is dumped by the individuals in the low lying areas which are then

picked up by the local body who collects the garbage on trolley handcarts and dumps the waste in an unorganized manner into the roadside gaps without any treatment. The waste is kept open at the collection points, which is kept open at the collection points, which leads to subsequent foul smell, water, air pollution and unhygienic conditions. There are no specific disposal site maintained by the PMC. The local body does not have adequate and suitable vehicles for collection of waste or garbage.

**3. *Transportation***

Transportation of the garbage is in open truck, dumper and tractor. The local body does not have suitable vehicles for the transportation. At the same time garbage in terms of timely lifting and transportation. At the same time garbage is handled manually which leads to health problems to the workers.

**4. *Treatment and disposal***

At present the waste does not undergo treatment and a crude method of dumping solid waste in low-lying areas, is in practice.

**5. *Waste Generated per capita***

The sources of solid waste generation in Ara urban area are the household, hotels, markets, education institutions, offices etc. The quantity of waste generated ranges from 650MT-800MT, out of which 40% is domestic waste and 60%, is industrial & commercial waste. The solid waste comprises of vegetables fractions (49%); combustible fractions (12.5%) and non combustible fraction (38.5%). The analysis reveals that at the aggregate level, the average per capita waste generated is 531 grams (year 2017).

**6. *Disposal Facility***

The local bodies are dumping the waste without following any scientific method in low lying areas as well as the outskirts of the city besides the dumping ground.

## SOLID WASTE MANAGEMENT ISSUES

The state of solid collection method is unorganized and unscientific in Ara. The local bodies are only able to collect part of the total quantum of waste generated in the city. Unattended waste are left on streets lead to drain blockages, soil and ground water pollution and results in acute unhygienic conditions. Major issues of MSW sector includes:

***1. Indiscriminate disposal of waste by the residents***

The spacing between the dustbins is more than 1.5km, leading to litter of waste on the local and cluster level streets.

***2. Absence of Modern Waste Collection Techniques and instruments***

The Waste collection and transportation is handled using the age-old techniques of broom and wheel borrowers due to narrow streets and lack of suitable infrastructure. It is worth mentioning that piecemeal approach on modernization of waste management techniques collapses with change in administrative set up.

***3. Non-Segregation and Recycling/Reuse of Solid Waste***

The intermixing of waste during collection and transportation lead to the increase in quantum of waste to be disposed.

In a recent report it is estimated that, the current reate of waste generation is about 450 to 600 gms/person/day. For 2031 it is projected that, the waste will be produced at the rate of 600 to 800 gms/capita. At this rate the waste generated will be about 2092 tonns per day.

On the basis of this data, the problem of waste management will need more concern.

In availability of landfill site for waste disposal has lead to the dumping of waste along the major roads and low-lying drainage channels in south of the city.

## SOLUTION

The landfill method requires costly land. This method is not sustainable neither environment friendly. The ground where MSW is dumped becomes useless for a long time. The surrounding area becomes

polluted and creates health hazards for the nearby habitants. The ground water becomes polluted. Though in Ara there no monitoring system or any agency to look after the environmental pollution created by waste management system.

Reuse and recycle can be a good solution to the problem. In the present waste management system different types of waste are mixed up at the collection point. So, reuse and recycle is not possible. The mixed waste can't be decomposed neither can be combusted.

### A. Recycle and reuse

The solution to this problem is reuse and recycling. Reuse and recycling is possible only when different types of waste does not get mixed up at the collection point.

It is estimated that 80% of the waste can be reuse and recycled (1). Thus the reduction in the total amount of waste will result in reducing the handling cost. This will further reduce the total amount of staff engaged in the Solid Waste Management (SWM) system. By the selling of waste and recycling, local bodies can generate the revenue.

This will also reduce the requirement of costly land required for dumping the waste.

### B. Role of rag pickers

Rag pickers can play very important role in the recycling of waste. Though they are collecting and recycling the waste, but in a very insignificant manner. They are working for their lively hood and playing role in the recycling of the waste but they are not recognized.

If they are recognized and supported by the residents and other concerned authorities they can play a very important role in recycling the waste and thus reducing the work of AMC. They should be recognized by the AMC and they should be organized to take services from them.

### C. Zero waste technology (ZWT)

Zero waste technology (ZWT) should be introduced in all the small medium and large scale industries. In this technology the production is done in such way that, least amount of waste is produced in the process of production. The process of production is done in such a way that waste is also reused during the process..

## PROPOSALS

1) Reuse and recycling should be mandatory for all the residents and different waste generators of the city.
2) The local bodies should educate the people about reuse and recycling.
3) Zero waste technology (ZWT) should be introduced in all the small, medium and large scale industries.
4) Local bodies should give tax incentives to those who recycle the waste.
5) At the garbage points there should be four different types of bins. In these bins different type of waste can be stored. Such as the Organic waste, recyclable and toxic waste should be disposed off in different bins. Hospital waste should be kept in separate bins.
6) Bins should be kept according to the suitability and requirement of particular places, for example vegetable markets should be provided larger bins to accommodate large quantity of vegetable waste. It can be given directly to the animal owners to feed to cattle.
7) Industrial waste should be recycled as far as possible.
8) Garbage bins should be placed at regular interval of 100 meters of minimum 1 tonne capacity.
9) Hotels, restaurants and other similar type of waste producers should segregate their waste at the source so that the waste of similar type can be stored and disposed at large scale.
10) Large institutions and offices should donate their old and useless items publicly to the needy.
11) Demolition and construction waste should be sold or donated directly to the people.
12) The hazardous hospital waste should be treated in the incinerators.
13) The use and production of polythene carry bags should be banned.
14) The use of disposable plastic glass and plates should be reduced.
15) Use of paper carry bags and packets should be encouraged.

16) The traditional (vernacular) technology of making earthen posts, cups, plates and of leaves should be encouraged.
17) In packing and packages use of plastic and polythenes should be reduced and paper should be encouraged.
18) Individuals and NGOs should be encouraged to recycle and reuse the MSW.
19) Organic waste should be send directly for the composting from the source of production to the composting ground.
20) Rag pickers should be recognized and encouraged. So that, they help in reuse and recycle the waste. In this way, they may also get proper employment.

## CONCLUSION

Prevention is better than cure. We can't prevent generation of MSW but we can reduce the total amount of waste by reuse and recycling. By the reduction of waste we can further reduce the handling cost and the requirement of costly instruments for the disposal of wastes. The local bodies can also generate revenue by selling MSW. Various guidelines as mentioned above have been developed for solving the problem of management of MSW for urban area of Ara. Hence, a proper strategy for Municipal Solid Waste Management can be developed keeping in view of city's waste type and its disposal cost based on above discussion.

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**TABLE I**
**THE GENERATION OF WASTE**
**(TYPES OF WASTES GENERATED FROM DIFFERENT PLACES IN THE URBAN AREA OF ARA)**

| Sl. No. | Source of waste | Type of waste generated |
|---|---|---|
| | **Household** | Carry bags, Bottles, Containers, trash bags, vegetable waste, food waste, old clothes, old furniture, ash, |
| | **Health and medicine** | Disposable syringes, glucose bottles, Blood and uro bags, intravenous tubes, Cathetors, surgical gloves, cartoons, |

| | | |
|---|---|---|
| - | **Hotel and catering** | Packaging items, Mineral water bottles, Plastic plates, glasses, spoons |
| | **Air/Rail and travel** | Mineral water bottles, plastic plates, glasses, spoons, plastic bags |
| | **Building construction** | Old bricks, broken tiles, wooden fixtures, old trusses, plaster waste, cuttings of tiles and stones, |
| - | **Small scale industry** | Industrial waste like plastics and pouches, leather and rexin cuttings, cardboards, plastic bottles, clothes cuttings, plastic cuttings |
| | **Offices and institutes** | Paper waste, used cartridges, old computers, old furniture, e-waste |
| | **Meat Shops** | Cartoons, meat waste, |
| | **Vegetable markets** | Vegetable waste, cartoons |

**TABLE II**

**PHYSICAL COMPOSITION OF MSW IN Ara**

| Sl. No. | Ingredients | Percentage |
|---|---|---|
| 1. | Total compostable | 51.96 |
| 2. | Paper etc | 4.78 |
| 3. | Plastic | 4.14 |
| 4. | Glass | 2.0 |
| 5. | Metal | 1.66 |
| 6. | Inert | 25.47 |
| 7. | Rubber and leather | 1.17 |
| 8. | Rags | 4.17 |
| 9. | Wooden matter | 1.43 |
| 10. | Coconut | 2.34 |
| 11. | Bones | 0.01 |
| 12. | Total | 100 |

Source: BPCB (2015)

**Table III**

| **Urban Development & Housing Department** | | | |
|---|---|---|---|
| Monitoring Format for Solid Waste Management | | | |
| **Name of ULB:- ARA NAGAR NIGAM, ARA.** | | | **Reporting Month :Dec,17** |
| **S.No.** | **Particulars** | **Status** | **Remarks** |
| 1 | No. of wards in which door to door collection is being done | 45 | |
| (a) | By ULB staff | 0 | |
| (b) | By Outsourced Agency | 45 | |
| 2 | No. of wards from where the waste is being lifted every day | 45 | |
| (a) | By ULB staff | 23 | |
| (b) | By Outsourced Agency | 22 | |
| 3 | Reason, If the waste is not being lifted every day | Lifted every day | |
| 4 | No. of wards where road sweeping is done every day | 45 | |

| | | | |
|---|---|---|---|
| (a) | By ULB staff | 23 | |
| (b) | By Outsourced Agency | 22 | |
| 5 | Reason, If road sweeping is not done every day | No | |
| 6 | Do you have land for processing of waste (Yes/No) | No | |
| (a) | If Yes, give details of land (area & location) | - | |
| (b) | If No, whether you have tried to purchase/acquire land (Describe in detail) | | |
| 7 | Is any processing of waste is being done? | No | |
| (a) | If Yes, give details (Qty. of waste being treated and Qty. of product) | | |
| (b) | If no, have you tried to give contract for processing of waste? | Under Consideration | |
| 8 | Where are you dumping waste (on identified land or on road side or on other's vacant land) | Road side and other vacant land | |
| 9 | No. of equipments available in working Condition | Existing | Purchased in reporting month |
| (a) | Tractor | 7 | |
| (b) | Hand Cart without bins | 200 | |
| (c) | Hand Cart with bins | No | |
| (d) | Tricycle without bins | 50 | |
| (e) | Tricycle with bins | 44 | |
| (f) | Auto tipper/Tata Ace | 9 | |
| (g) | Containers or Bins (1.1 cum capacity) | 69 | |
| (h) | Containers or Bins (2.5 cum capacity) | - | |
| (i) | Open Trucks | 2 | |
| (j) | Covered Trucks | - | |
| (k) | Compactor | 2 | |
| (l) | Dumper Placer | 2 | |
| (m) | Road sweeping Machine | 1 | |
| 10 | Total Quantity of Waste (in Tons) collected/lifted & transported | 125 MTD | |
| 11 | Total Expenditure on SWM (in Rs.) including purchase of equipments, payment to outsourced agency etc. but excluding payment of salary to workers | 18385359.00 | |

Source ARA Nagar Nigam

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