

## **Assessment of Municipal Solid Waste in Northeastern States of India**

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### **Abstract**

Municipal solid waste and its management is a big concern for India these days. Due to rapid growth of urban population, as well as constraint in resources, the management of solid waste poses a difficult and complex problem for the society and its improper management gravely affects the public health and degrades environment. In this regard, proper planning is required at the National and Regional levels. In the absence of centralized strict guidelines and regulations, different states in India are practicing various methods to treat and dispose the waste in the best way possible. However, due to the limited resources and precise regulatory guidelines, the treatment and disposal of solid wastes in an effective and appropriate manner is grossly inadequate. The different waste management techniques and the management systems of the seven northeastern states have been reviewed and studied in the present project. It was observed that the present management systems of municipal solid waste are inadequate. However, municipalities and other organizations are making efforts for managing the waste. The present paper summarizes the current situation in the seven northeastern states of Arunachal Pradesh, Meghalaya, Nagaland, Manipur, Assam, Tripura and Mizoram.

**Keywords-** Municipal solid waste, northeastern states, management system, management techniques.

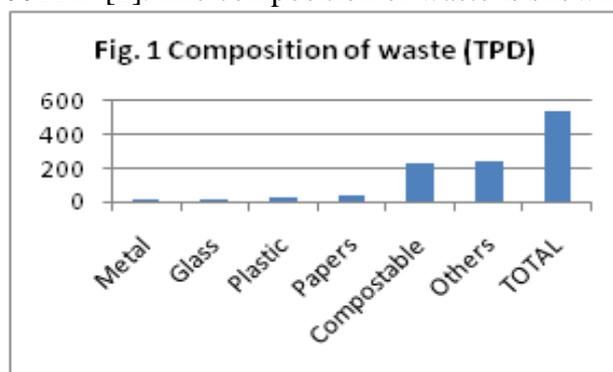
### **1. Introduction**

Municipal solid waste (MSW) is the trash and/or garbage that are discarded in day to day activities in residential areas. Municipal solid waste (MSW) management refers to the systematic process of treating wastes that comprises of waste segregation and storage at source, primary collection, secondary storage, transportation, secondary

segregation, resource recovery, processing, treatment and final disposal of solid waste into landfills. Characterization of solid waste is important in evaluating alternative equipment needs, system and management programs and plans with respect to implementation of disposal and energy and resource recovery options. Incineration reduces the volume of the original waste materials by 95-96 %, depending upon composition and degree of recovery of materials such as metals from the ash for recycling. Sanitary landfilling with leachate and gas collection is the recommended method for disposal of MSW [1].

## 2. Arunachal Pradesh

The annual production of solid wastes in Arunachal Pradesh is calculated to be approximately of 600TPD [2]. The composition of waste is shown in Fig. 1.



In Arunachal Pradesh, landfilling is the common practice of waste disposal in local communities. Some other techniques used are incineration, composting and recycling. The state lacks in waste segregation procedures. Installation of dustbins all over the states is not adequate. The landfill sites constructed are also not engineered well.

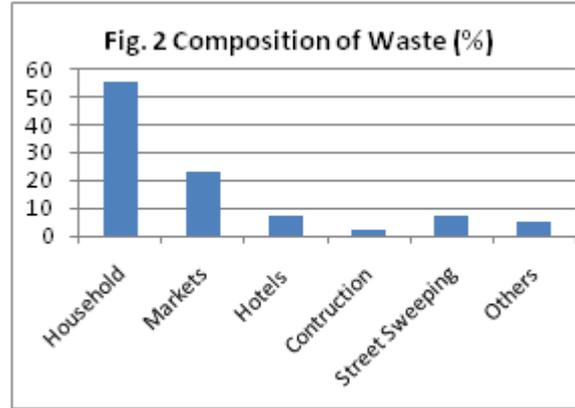
The state produces nearly 240 kg of daily solid waste of mixed nature, which cannot be segregated. This waste quantity is dumped at landfills at the designated sites. At present the total budget for the landfill areas is Rs2.00lakhs only [2]. To reduce the waste being sent to the landfills, a total of twenty low cost compost pits will be established in selected villages and nursery areas. Total quantity of compostable waste from the new project areas is estimated to be around 230 kg per day. The compostable waste is planned to be placed in compost pits. Total cost for the construction and maintenance of compost pits is estimated to be Rs10.00 lakhs only [2]. This will greatly reduce the load on the landfill while also producing a usable product.

## 3. Meghalaya

The solid waste generated in Greater Shillong Planning Area is estimated to be at 170TPD. The waste generation rate estimated for this area is 0.4 kg per capita per day [3]. The composition of waste is shown in Fig.2.

There is one existing compost plant located in Mawiong dumpsite which is located 8

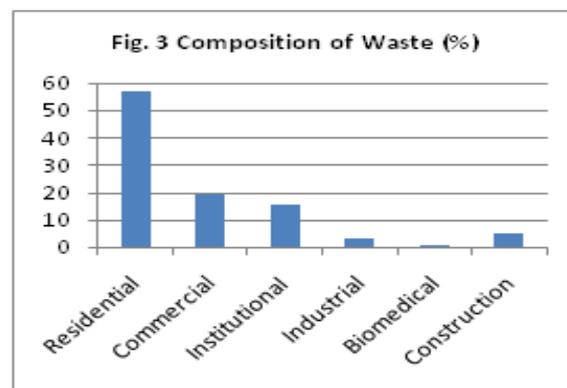
km away from the city. The site has been operational since 1938. However, due to very little waste segregation procedures adopted, the compost facility is facing problem in efficient operation. The facility of house to house collection of waste is available in only a few select areas.



At present to facilitate the collection of waste, several RCC dustbins of various capacities are made available in areas where house to house collection is not done. Also, a compost plant with capacity of 100 MTD was constructed in Marten Mawiong dumpsite in 2002. It is currently proposed for the rehabilitation and expansion to 150 MTD capacities by private operator [3]. However, these initiatives have shown little improvement in solid waste management. Therefore, to improve the practice of depositing the wastes at designated sites, an engineered landfill and associated infrastructure for leachate collection facility is presently being constructed. This is being funded by the North-Eastern Region Capital Cities Development Investment Programme Tranche 1 [3].

#### 4. Nagaland

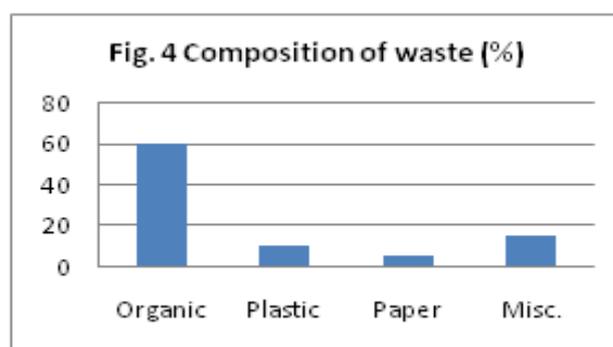
In Kohima, the responsibility of the waste management lies with the Kohima Municipal Council. At present, the amount of waste generated from the Kohima city is around 60TPD [4]. In the composition of MSW almost 64% is composed of biodegradable waste. The composition of waste is shown in Fig. 3.



Processing or recycling procedures are not currently applied in Kohima. The only recycling carried out to some extent is by the rag pickers. Wastes are generally dumped in open streams or burnt in empty spaces. This is due to the limited waste storing capacity available in the city. At present, there are around 30 storage bins available. Also, few mechanized containers of 4.5 m<sup>3</sup> capacity are introduced in the areas for the proper enhancement of waste storing capacity. The total area of the disposal site is about 56.5 acres located at the southeast of the city. All municipal wastes are deposited on a sloping site about 8 km from the city. The Siste Ru river flows just below the disposal site and, as a result, the majority of dumped wastes accumulate in the river. At present, no treatment is provided for collected solid waste.

## 5. Manipur

The estimated quantity of waste generated in Imphal is 100TPD [5]. The composition of waste is shown in Fig.4.

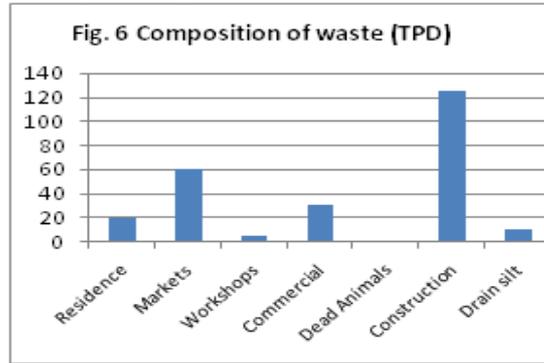
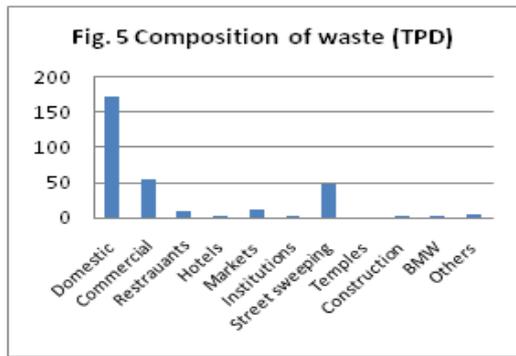


The present status shows that there is no processing of waste at the disposal site and lack of community participation. The Municipal Solid Waste generated from the Imphal Municipality area are now haphazardly dumped at the privately owned low lying ground at Lamphelpat, Imphal. Under Sec 33 (A) of the Water (Prevention and Control of Pollution) Act, 1974, Manipur Pollution Control Board has carried out inspection and monitoring of Solid Waste all along the banks of Nambul River and instructed the concerned Municipal authority in order to comply the provision of the Municipal Solid Waste Management and Handling Rules. Recently, the local government has taken up the initiative of door-to-door collection. Manipur based Centre for Research on Environmental Development, a Non-Governmental Organization, has been awarded the Green Globe Foundation award 2012 for outstanding contribution at the grass root level. The NGO generated mass awareness on pollution related issues and addressed critical issues of environment degradation. In the initial stages solid wastes were collected using cycle rickshaws having different chambers for bio-degradable and non-biodegradable waste and make vermicompost for the farmers and gardeners. Also a composting facility is being established for processing and treating waste to produce an estimated 15-20 tonnes of compost of good quality. The solid waste management plant is being constructed by Department of Municipal Administration Housing and Urban Development at Lamdeng under

Jawaharlal Nehru National urban Renewal Mission (JnNURM) The facility is presently under construction. Environment Impact Studies at Langol Wastes Dumping Site and Lamdeng Khunou is being carried out for further improving the solid waste management programs presently employed in the state.

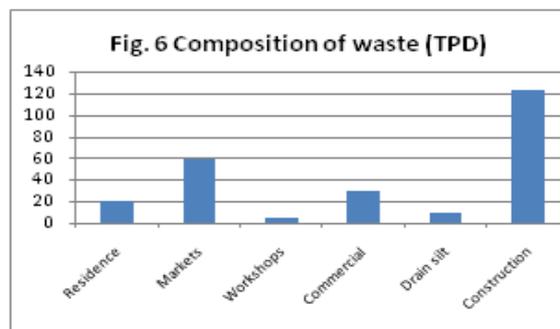
### 6. Assam

The quantity of daily solid waste generation in Assam is 300TPD. The composition of waste is shown in Fig. 5 [6]. The Boragaon area site has been earmarked by the Government of Assam for the MSW disposal. The energy that could be generated from the waste in Guwahati city is estimated to be approximately 4.2 MW daily. This energy, if properly harnessed, can solve the power crisis problem of the city to a large extent. The West Boragaon Treatment plant is undergoing certain changes in order to adopt the novel methods of waste treatment. A new provision for treatment of hazardous and electronic waste is also underway at the plant site [6].



### 7. Tripura

The quantity of daily solid waste generation in the city of Agartala is 250TPD. The composition of the waste is shown in Fig. 6 [7]. At present all the garbage collected from the city is disposed in an open area in two dump yards by way of landfill without proper processing. However, presently modifications to the plant have already started with scientific approach at Debendra Chandra Nagar dump yard.



As per the guidelines in solid waste management given by JnNURM, new initiatives are being taken which includes procurement of modern sophisticated solid

waste management vehicles, installation of de-silting machines for drain clearance and phasing out of old vehicles and small containers. Also, use of sweeping machines to improve cleanliness and efficiency is being planned. Efforts are also being made to create awareness among people. Finally, construction of a 250TPD solid waste processing plant is also approved.

## 8. Mizoram

In Mizoram, waste generated per day is estimated to be 165 TPD [8]. The composition of waste is shown in Fig. 7.



In Aizwal, there is no waste segregation procedure in place and no planned disposal. There is only one dumping site which is about 20 km from the City. This has led to indiscriminate dumping of wastes in public drains and open spaces. To take care of the problem of solid waste management, waste is now collected from sanitation points designated by Local Councils. There is no door to door collection. The disposal of MSW is entrusted to the Local Councils through fund provided by the Aizwal Municipal Council (AMC). Public contribution is 10% of the funding provided by AMC. The streets are swept on a regular basis by the AMC. Also, detailed project report for SWM project is submitted to the Ministry under North East Region Capital Cities Development Investment Programme (NERCCDIP) amounting to approximately Rs. 34.6crores [8]. This also includes a compost plant with a capacity of 50 TPD, an organic waste treatment plant and a municipal solid waste incinerator. The latter is to avoid and restrict burning of waste in the open. In addition, landfill sites have also been identified to final disposal of wastes [8].

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