FOOD WASTAGE AND WASTE MANAGEMENT

SUMMARY:

Delhi is the national capital of India. It is the biggest trade and consumption centre in North India. It acts as a major distribution centre by virtue of its geographical location and other historical factors. The goods produced elsewhere are imported for local sales as well as for export to other states. According to the Economic Survey of Delhi 2014-15, 47 per cent of food grains and 78 per cent of fruit and vegetables imported to Delhi are re-exported to other parts of India as well as foreign nations. Marketing of agricultural produce in Delhi is through a network of regulated markets. Delhi Agricultural Marketing Board (DAMB) is the apex body established in 1977 under the Delhi Agricultural Produce Marketing (Regulation) Act 1976 which exercises supervision and control over various agricultural produce markets and promotes better marketing of agricultural produce by developing infrastructure facilities. The seven Agricultural Produce Marketing Committees which are functional in Delhi are shown as below:-

S.No.	Name of APMC	Commodity	Total Land Area
1.	APMC, Azadpur	Fruit & Vegetable	76 Acres
2.	APMC, Narela	Food Grain	33 Acres
3.	APMC, Najafgarh	Food Grain	11 Acres
4.	APMC, Keshopur	Fruit & Vegetables	15.58 Acres
5.	APMC, Shahdara	Fruit & Vegetable, Food Grains, Fodder	37.03 Acres
6.	FP&EMC, Gazipur	Fish & PoultryFish Market	29.71 Acres
7.	Flower Market	Flower, Cut Flowers & Potted Plants	

SOURCE: Delhi Agricultural Marketing Board

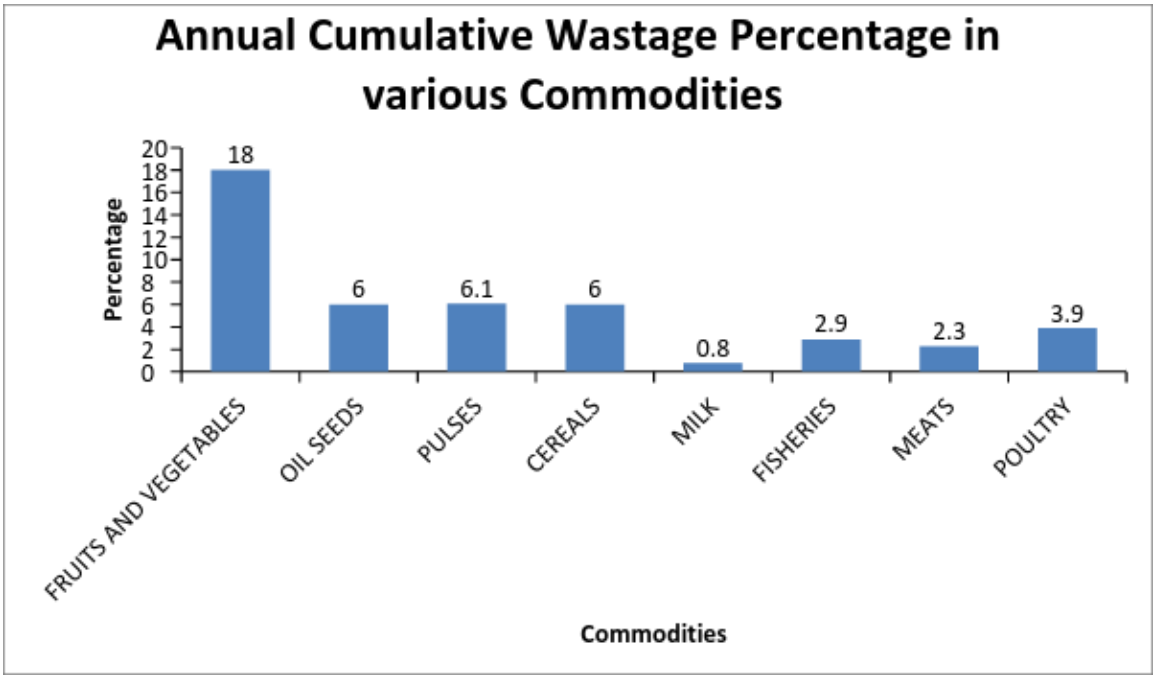
The municipal solid waste overview in the city of Delhi is as follows:

Agency	Area (Sq. Km)	Population (Million)	Waste Generation (MT/Day)	Landfill (MT/Day)	Composting (MT/Day)
MCD	1399	13.8	7000	5500-6000	350-400
NDMC	42.8	4.5	250	170	80
Delhi Cantonment Board	43	0.13	60	60	0

SOURCE: Delhi Pollution Control Committee

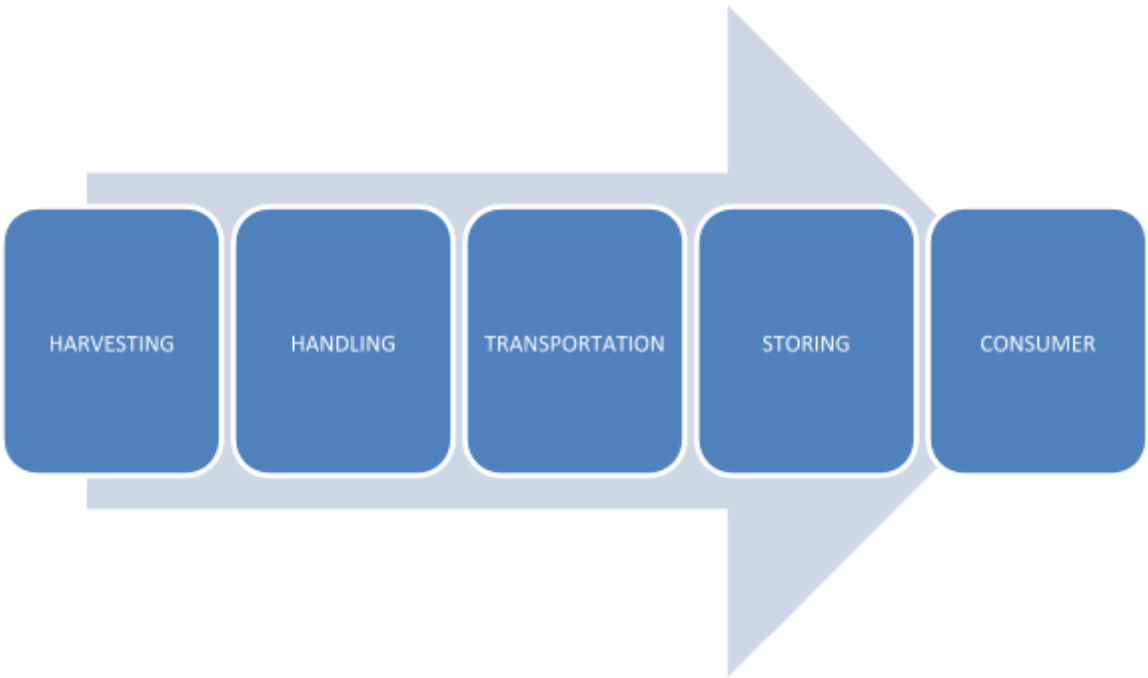
Only about 5 per cent of the total waste generated is converted into compost and the rest of the waste goes into the landfills and loses its potential value which if tapped could provide a great benefit to various stakeholders of the society.

According to the Central Institute of Post-Harvest Engineering and Technology (CIPHET), approximately 18 per cent of the country's fruits and vegetables are wasted annually.



Source: Central Institute of Post-Harvest Engineering and Technology (CIPHET), Ludhiana

The agricultural products go through various stages from start to end. These are:



The step where major food losses take place is after the harvesting. The Post-Harvest losses account for about 25% losses. This waste is generally generated in the last few steps when the fruits and vegetables are in the market which makes the markets in Delhi a major source of organic waste which has a huge potential to be utilized as a resource.

PROBLEM:

- Waste Disposal:

  The collection, transportation and disposal of the waste from the vegetable markets in Delhi is a huge problem. Improper management of such waste can lead to public health problems. The current mode of treatment used for the vegetable waste from the markets is to collect the waste in the market and to transport it to the landfills. Heaps of such waste are spread all over the market place and remain uncollected for days together and start rotting at the same place. This creates very unhygienic conditions. Further, during collection and transportation process it gets mixed with non-biodegradable waste, creating problems during treatment.

  In Delhi, there are 3 landfills sites namely Ghazipur sanitary land fill site, Okhla Sanitary land fill site, Bhalswa land fill site. These landfill sites are not designed as per the MSW rules. In the absence of availability of other landfill sites, all the 5 Municipal Bodies are using these three sites for illegal disposal of waste.

  Problems caused by landfills are:

  - Odour nuisance from gaseous decomposition
  - Potential for methane migration which may lead to explosions or fires
  - Negative health effects of carbon dioxide (CO2), methane, and non-methane organic compounds(NMOC)

SOLUTION:

Vegetable and fruit waste from the Mandis is generally stale or spoilt which is not fit for human consumption. This material is usually high in fibrous content. In the market, the collected waste material is usually mixed with street sweepings and inorganic trash like rags, metals etc. It is therefore necessary to have an arrangement whereby only the vegetable waste component is separated. After separation of organic waste, DAMB can use the following mentioned technology to manage the left over waste from the seven principal markets functioning in Delhi.

Organic Waste Composter

Waste Composter converts the organic waste into extract compost in just 24 hours. An efficient conversion and ease to use makes it possible to make the environmentally and socially responsible choice of composting. It is a stand-alone unit and does not need associated equipment. This saves on space and effort and makes composting much more feasible.

Benefits of converting the organic waste from the Mandis in Delhi into compost are as follows:

- The waste problem in the city of Delhi can be alleviated through waste reduction since the organic part of the waste will be now composted. Thus will lead to a better quality of life for the citizens of the city

- Fertilizers from organic waste are more effective for the health of soil (compost maintains the fertility of the soil in the long run) as well as of humans and therefore benefit the farmers in the region as well as the consumers

- Compost buffers the soil, neutralizing both acid & alkaline soils, bringing pH levels to the optimum range for nutrient availability to plants

- Compost helps sandy soil retain water and nutrients

- Compost may suppress diseases and harmful pests that could overrun poor, lifeless soil

- Methane is produced at uncontrolled anaerobic decomposition at landfill sites, while composting does not produce any such gas. Harmful greenhouse gas emissions are therefore reduced since large amounts of waste undergo controlled decomposition at a solid waste management site.

- Composted waste can also be used as the filling material while constructing the roads under major highway projects. It has been observed that the roads constructed using this waste tends to be more solid and durable.

On-Site process would solve transportation problems and add to the economic viability. But keeping in mind the space constraints in the markets of Delhi, these composters could be installed at another nearby site.

Estimated Cost involvement:

The various costs involved could be:

1. Plant Set up cost - About Rs.1 crore
2. Operations cost: -Rs. 2 per kg of waste

The plant set up cost includes the cost of the whole infrastructure including the building, equipment and the machines required.

The operations cost includes pay of the staff, electricity, water, maintenance of the plant, depreciation and the servicing of the capital investment.

Income:
The income for the plant is expected to come from the sale of gas and the manure.

COMMUNITY OR SEGMENT THAT WILL BENEFIT:

- Farmers:

  Working on food waste management can be a big step in backing our farmers and their interests. This will allow them to significantly reduce their costs by providing them with manure and reduce their dependency on chemical fertilizers.

- Businessmen:

  People indulged in wholesale and retail businesses in the mandi can benefit a lot from the waste reduction because they invest high value in procuring and storing food and if they get wasted they have to bear the cost. Not only this, their cost of procurement too will fall with fall in production cost of farmers as the process is interlinked. They will also get a clean and hygienic working place.

- Consumers:

  When farmers and businessmen have their low cost then the consumers can enjoy more purchasing power. Reduced food waste, will lead to fall in the consumer's expenses too. When the waste would be low, farmers would produce quality goods which will provide consumers with healthy food.

- Environment/Natural Resources:

  With high level of consumer demand, the environment and the natural resources are currently being negatively affected. Reducing wastage can reduce the claim on natural resources (land, water, and energy) that were used in producing the food.

IMPLEMENTATION CHALLENGES:

- Lack of investments in waste management:

  Waste management is not at all given the importance in Delhi. Even though waste has a very huge potential of being used as an important resource, there are very less investments being made in this sector. However, start-ups in India have started looking towards waste as a useful asset.

- Limited Awareness:

  Due to limited investment in waste management technologies, there is limited awareness of best practices to manage the waste.

- Space Constraints and Increasing real estate cost:

  Storage facilities require large portion of land to step up. As the cost of real estate in Delhi is very high, therefore, land poses a major challenge for the solutions to be implemented. In Delhi, the various mandis have very limited available space which is already being over utilised.

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