



# An Overview On The Existing Solid Waste Disposal Methods In Uttar Pradesh India

**Dr. Poonam Chaudhary**  
Assistant Professor

**Shweta Chauhan**  
Research scholar

**Anchal**  
Research Scholar

Department of Geography, Meerut college Meerut,  
Chaudhary Charan Singh University, Meerut U.P India

**Abstract-** The study was conducted to explore the situation of solid waste disposal in Uttar Pradesh. As it is visible to us that nowadays pollution has increased in an unmanageable order which leads to change in climate and ecosystem which affects all the living organisms. There are various sources of solid waste production in Uttar Pradesh like Information Technology factories, hospitals, household, various industries etc. Most of the municipal solid wastes are rich resource in terms of recycling or reusing as per the findings and analysis of the obtained data. There are various methods which are universally accepted for disposing solid waste like composting, Burning etc. In this study author have discussed major methods of solid waste disposal which are in practice in Uttar Pradesh.

**Keywords –** Overview , Solid Waste , Waste Disposal , methods , Types of Waste etc.

## Introduction

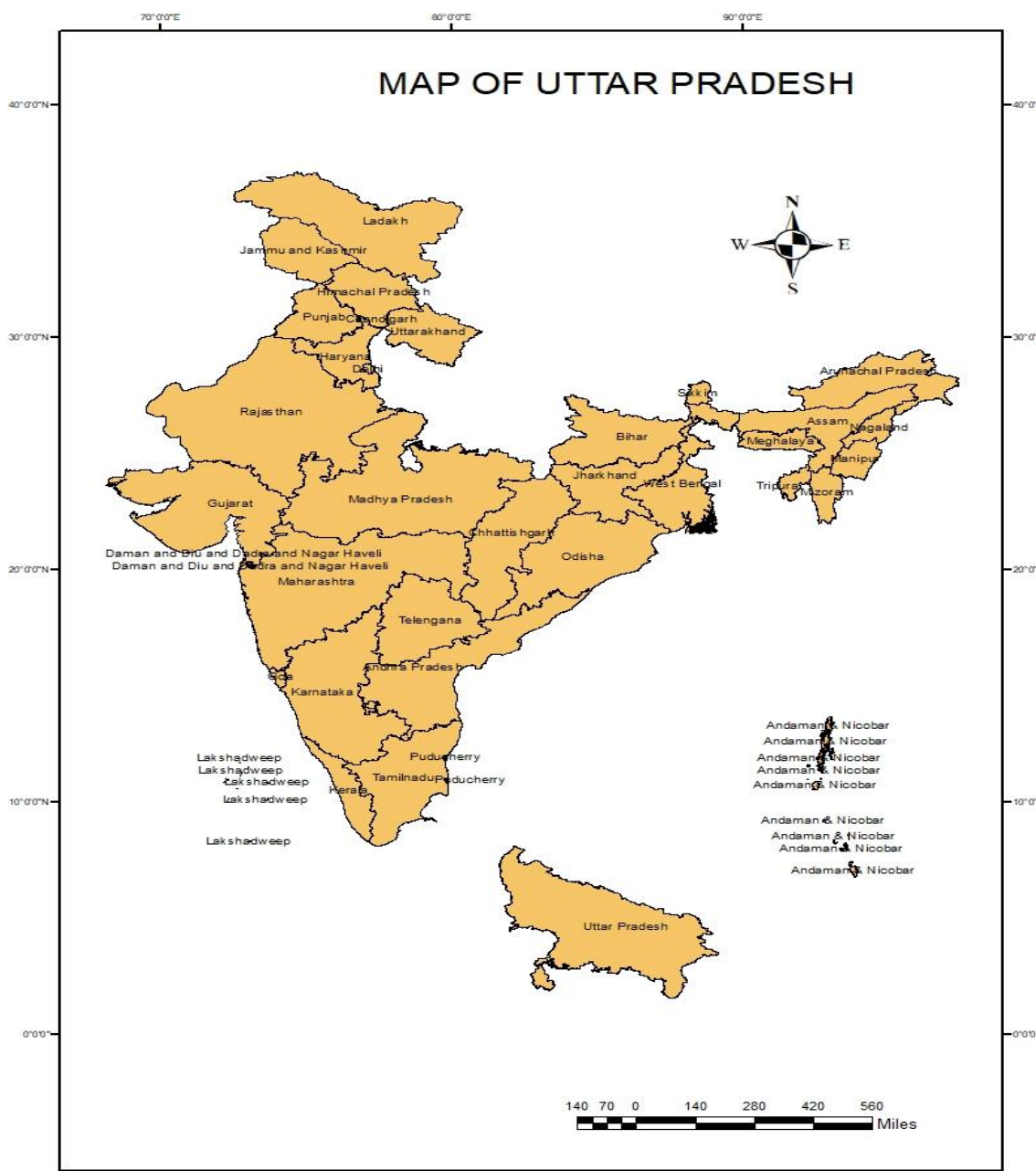
Uttar Pradesh is the 4th largest state in terms of geographical area covering 9.0 per cent of the country's geographical area. It is also the most populous state in India consisting of 19.96 crore (199.6 million) inhabitants as per 2011 Census, out of which 15.51 crore live in rural areas and 4.45 crore in urban areas. There has been a net addition of about 1.09 crore persons in the urban areas during 2001-2011. Thus, about 16.50% of the total population and 11.80% of the urban population of India reside in Uttar Pradesh. Generally, the term Solid waste refers to any discarded material that is abandoned by being disposed of burned or incinerated, recycled or considered waste like. Solid waste can be solid, liquid, gaseous and semi-solid etc. Solid waste is serious problem of developed and developing countries now a day. In developing countries, there is rapid increase in solid waste due to urbanization, population growth, industrial growth and rise in living standard. Residential, industrial and commercial activities generate unwanted solid waste. It is categories according their origin like domestic, industrial, commercial, institutional and construction. Solid waste is generated in such a quantity that managing it is a big problem. Solid waste management includes the processes and actions to manage solid waste from its creation to final disposal. This includes the collection, transportation, treatment and disposal of waste. Each country manages solid waste in different ways at its own level. All over the world, waste is used to produce electricity, fertilizers, landfill and recycling. Recently, Europe is recycling solid waste about 41%. China also invests \$ 6.3 billion \$ to achieve his 30% recycling of waste by 2030. United State recycled 42% of their solid waste. The United States of America is one of the largest producers of waste, United States established major industry for waste management. United States waste is regulated by the EPA (Environmental Protection Agency) under the 1976 Resource Conservation and Recovery act (RCRA).

## Study Area

Uttar Pradesh is one of the largest state in union of India. It covers the total area of 243,290 square Kilometer. It is situated between 23° 52' N and 31° 28' N latitudes and 77° 3' E and 84° 39' E longitudes. The capital of U.P. is Lucknow which is situated in the

east central part of the state. However, the level of urbanization (22.28%) in the State is quite low as compared to all India figures of 31.16%. The decadal growth of urban population during 2001- 2011 has been 28.82 per cent as against 31.80 per cent during 1991-2001. Administratively Uttar Pradesh is divided into 75 districts under 18 divisions which are Agra, Aligarh, Azamgarh, Allahabad, Kanpur, Gorakhpur, Chitrakoot Dham, Jhansi, Devi Patan, Faizabad, Bareilly, Basti, Vindhyachal (Mirzapur), Moradabad, Meerut, Lucknow, Varanasi and Saharanpur. At present there are 653 Urban Local Bodies in the state with total area of 6264.57 sq. km. Urban Local Bodies consists of 17 Nagar Nigams (NN), 198 Nagar Palika Parishads (NPPs) and 438 Nagar Panchayats. The population of Uttar Pradesh is 23.83 crores in 2022. U.P. is most populated state in India. It is characterized by hard rock and a varied topography of hills, plains, valley and plateau. The state is well drained by the river Ganga, Yamuna and their tributaries. Most of area of Uttar Pradesh is covered by the alluvial soil.

The climate of Uttar Pradesh is generally defined as tropical monsoon type. The yearly average rainfall in U.P. is 43.33 millimeters. The major sector of Uttar Pradesh economy is agriculture. Wheat, pulses, oilseeds, rice, sugarcane, and potatoes are the main crops grown here. Sugarcane is an important cash crop grown here. Tourism, computer hardware and software, information technology products and handicraft are other major contributors to the state's economy.



Source: Author's

## **Objectives of the Study**

The study is being conducted to explore and understand the current status or scenario of the region (U.P) in terms of disposing solid waste. The region has a very large no. in terms of population which leads to more consumption of services or resources which ultimately generates more waste (in any terms). The major problem with the solid waste is that how to deal with it, how should it be disposed so that it cannot harm our environment. The main objective of this study are as given below.

1. To overview and understand the present status of solid waste disposal methods in Uttar Pradesh
2. To explore and identify the major source of solid waste generation in Uttar Pradesh.

## **Findings and Discussion**

### **Solid waste source in Uttar Pradesh**

Major source of solid waste can be classified according their origin place. It can be industrial, domestic, institutional and agricultural.

### **Solid waste disposal methods**

Solid waste disposal management is usually referred to the process of collecting and treating solid wastes. It provides solutions for recycling items that do not belong to garbage or trash. Solid waste management can be described as how solid waste can be changed and used as a valuable resource. Improper disposal of municipal solid waste can create unsanitary conditions, and these conditions in turn lead to pollution of the environment. Diseases can be spread by rodents and insects. The tasks of solid waste disposal management are complex technical challenges. They can also pose a wide variety of economic, administrative and social problems that must be changed and solved.

At least 50-55 % Municipal Solid Waste is a valuable resource, which can be recovered into useful products by using different kind of methods. These methods are written below:

**Wealth from waste** – Municipal solid Waste contains bio-degradable matters. These bio-degradable matter can be converted into useful products like compost, methane gas etc. through the following process.

### **Waste to Compost**

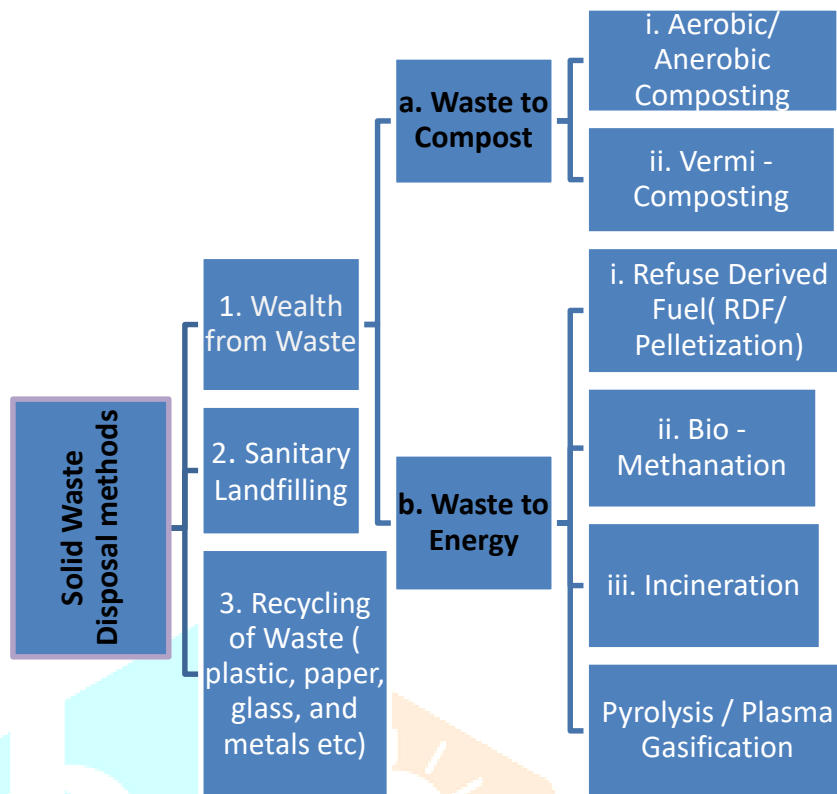
- I. **Aerobic/ Anaerobic Composting**- By Aerobic / Anaerobic composting, bio-degradable waste is converted into stable mass producing Carbon-di-oxide, Potassium and Phosphorous etc. useful elements for soil fertility.
- II. **Verme-Composting**-Verme-Composting also called Verme-Casting. In this process earthworms are used to making compost. Earthworm feed on the organic waste materials and give out excreta in the form of Verme-cast that is rich in Nitrate and mineral, which are used as fertilizers.

### **Waste to Energy-**

- I. **Refuse Derived Fuel (RDF/ Palletization)**- RDF/ Palletization of solid waste is a process of segregating, crushing and mixing of high and low heat value organic waste. After solidifying, pellets or briquettes fuel are produce. This fuel can be used as a source of energy for power generation.
- II. **Bio-Metalation**- Solid waste is converted into biogas in presence of microorganisms under anaerobic condition. The gas is utilized for fuel engines and power generation.
- III. **Incineration**- Incineration is the process of direct burning of solid waste in the presence of excess air at the temperature of about 800°C to 870°C. Liberating heat energy, inert gases and ash. This process used for bio-medical waste.
- IV. **Pyrolysis / Plasma Gasification**- Pyrolysis is common method to convert solid waste into energy in the form of solid, liquid and gaseous fuel. It is thermal degradation of solid waste at different temperatures. In the absence of Oxygen.

**Landfilling sites in uttar pradesh- Landfill site identified:** Ayodhya, Azamgarh (5), Ballia, Bareilly (3), Basti, Bijnor (4), Bulandsahar (3), Ghaziabad (2), Hardoi (3), Hathras, Jaunpur, Kannauj, Kanpur, Kasganj (2), Kaushambi, Kheeri (2), Mathura (11), Moradabad, Muzaffarnagar (8), Pilibhit (14) Prayagraj (2), Sambhal, Sant Kabeer Nagar (4), Shamli (6), Sitapur, Sultanpur, Unnao.

Figure 1: Solid Waste Disposal Methods



**Sanitary Land filling-** Whole solid waste cannot be converted into useful products. Remain solid waste is used for sanitary landfill. Now a day's government are using solid waste for land filling. The government of Delhi is working on a plan to use solid waste generated by urban centres for the construction of national highways. The first such project will be the Delhi-Meerut express way, where solid waste would be used for construction from Delhi's Ghazipur landfill site. According to a CSIR-CRRI study municipal solid waste contains 65-70% of soil components, which can be used in embankment construction after segregation from waste-NHAI.

**Recycling of Waste (Plastic, Papers, Glass and Metals etc.)-** Municipal solid waste, which contain plastics, papers, glasses and metals are recyclable. Which can be easily reused by the community.

The recyclable wastes are collected by Kabaddi's from households, compost plant, dump lands and sent to recycling industries to conversion into useful products.

In absence of adequate scientifically designed landfills for waste disposal, waste is disposed in dumpsites. There are 3184 dumpsites in the country as per information provided by SPCBs/PCCs, of which 234 have been reclaimed and remaining 8 have been converted to landfill. Maximum number of dumpsites are in Uttar Pradesh (609) followed by Madhya Pradesh (326) and Maharashtra (237) in that order. Maximum numbers of dumpsites have been reclaimed in Maharashtra (141), Madhya Pradesh (50) followed by Tamil Nadu (23) and Telangana (6) in that order. 3 dumpsites have been converted to landfill in Andhra Pradesh and 1 each in Meghalaya, Rajasthan, Sikkim, Telangana and Chandigarh.

#### Status of Solid Waste Management in India

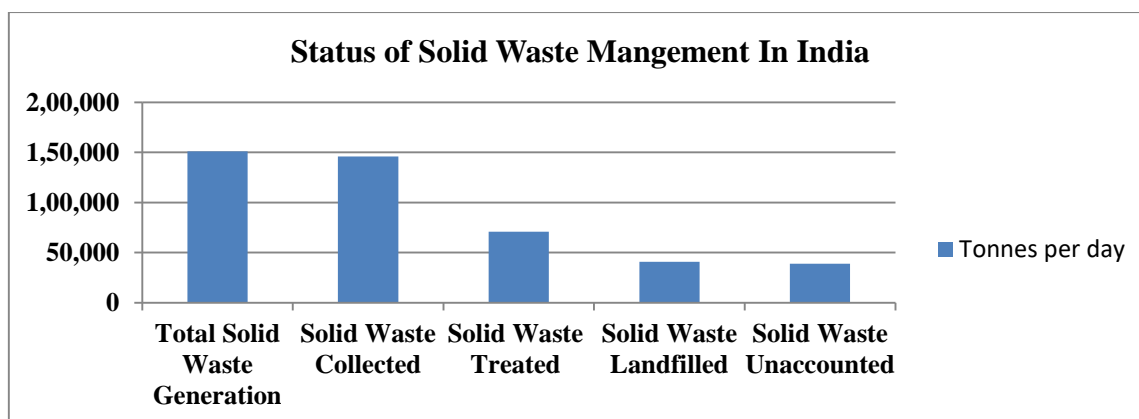
Status of solid waste Management in the country is given below:

Total Solid Waste Generation	1,50,847 tonnes per day
Solid Waste Collected	1,46,053 tonnes per day (96.8%)
Solid Waste Treated	70,973 tonnes per day (47%)
Solid Waste Landfilled	40,863 tonnes per day (27.08%)
Solid waste Unaccounted	39,010 tonnes per day (25.8%)

Source: Central Pollution Control Board Annual Report 2020-21

Solid Waste Management Trend (Year-wise) SWM information for the last six years (2015-21) has been examined and following are the observations: (a) Per capita Solid waste generation: Per capita solid waste generation has been calculated for the last six years and is given in Table 2.0. Marginal decreasing trend is observed in per capita solid waste generation over the last six years.

Fig 2



Time taken in decomposition of different wastes.

Sr. No.	Category of Wastes.	Time in years.
1.	Plastic Bags	20-1000
2.	Plastic Bottles	450
3.	Aluminium Cans	80-200
4.	Glass bottles	1000000
5.	Milk Carton with wax coating	3-4 months
6.	Paper towel	2-4 weeks
7.	Disposable napkins	450

Source-Solid waste management policy 2017- U.P

Solid waste generation per capita.

Year	Solid Waste Generation Per Capita(gm/day)
2015-16	118.68
2016-17	132.78
2017-18	98.79
2018-19	121.54
2019-20	119.26
2020-21	119.07

Source-Annual solid waste management report 2020-21

The Above data shows the disturbing conclusion of solid waste what we are using rapidly in our day life without knowing the impacts which it will give to our life. The 1<sup>st</sup> diagram shows the amount of solid waste we are generating each day. The proportion of generating is higher than the collection and management of solid wastes. The table just below the bar diagram shows the data about the decomposition of solid waste as per their characteristics. The plastic bags and glass bottles takes 100 to 10000 of years to decompose so it become a matter of thinking that how deeply we people are disturbing ecosystem as well as living things. The next table on solid waste generation per capita shows the temporal change in generation of solid waste per capita. The table shows that in the year 2016-17 per capita solid waste generation was much higher than any other years. Following the years 2018-19, 2020-21. In past six years the solid waste generation per capita was lowest in the year 2016-17.



## Conclusion.

It's a widely accepted fact that till 20's the most common method of disposing solid waste was Land-filling of solid waste. Land-filling is a process in which the waste deposits are dumped in dig on the surface. sometimes which we call it composting. This process is very common in rural India till now without caring about health and fertility of the land, water etc. By this study we can say that solid waste management still is milestone to achieve. There are various agencies which continuously working on the scenario of solid waste in the state and monitoring. In Uttar- Pradesh there are various plants which generates power from solid waste. The process of collecting waste like moving cars are good in cities but in suburban area or remote areas, villages are still not in the radar for collecting wastes. The most suitable activity for collecting waste in villages is collection from a waste dump yard which sometimes we call it Kude-daan or Kuda-ghar. The local municipality manages this yard. The study found that the methods are similar all over india in terms of solid waste disposal like separating the waste, then composting or burning depends on the nature of the waste. Sometimes it becomes very hard to tackle the waste from the local area's where no accessibility or reach of the small vans or trucks then some communities or people load them in a cart and deposits the waste in an accessible location. So it would be a very good step if there are should some places or some vans moving in every village, remote area like towns for collecting wastes. And Govt, should setup plants to every 20 km of radius area where the local employee can dump the garbage and dispose.

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