Waste Collection Data of India And Tamil Nadu In 2023

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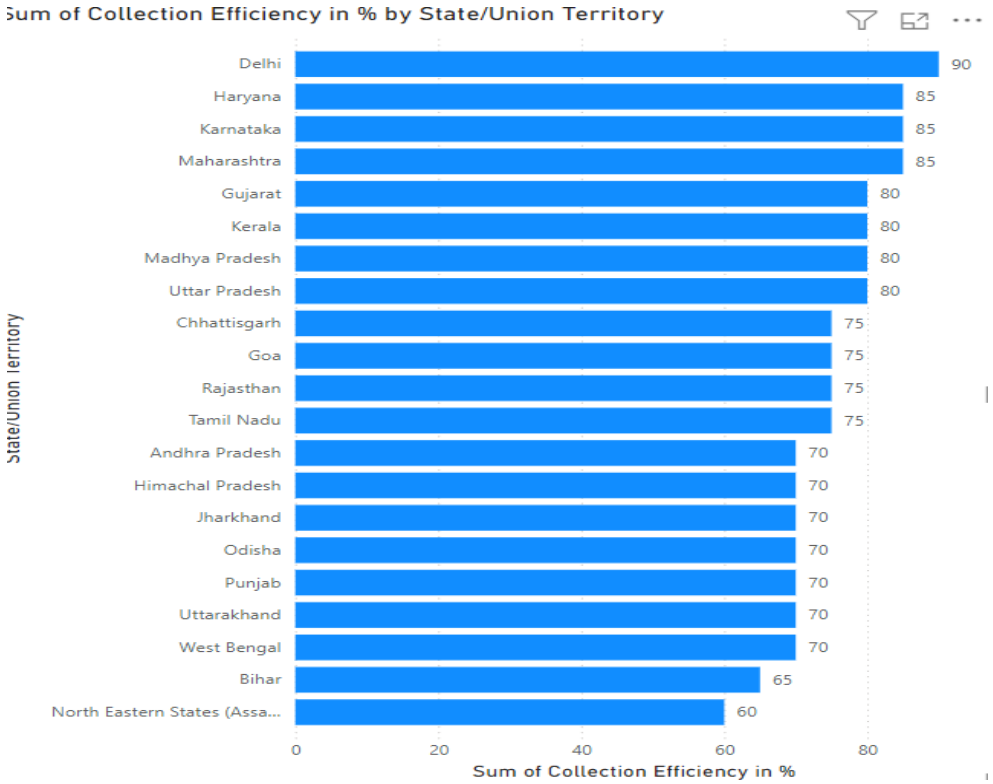
Estimated State-wise Waste Generation and Collection (2023)

State/Union Territory	Estimated Daily Waste Generation (Tonnes)	Major Cities	Collection Efficiency	Remarks
Maharashtra	9,000+	Mumbai, Pune, Nagpur, Thane	~85%+	Maharashtra has advanced waste management systems, but Mumbai still faces challenges.
Uttar Pradesh	7,000+	Lucknow, Kanpur, Varanasi, Agra	~80%	Waste generation is high due to large population. Challenges with segregation.
Tamil Nadu	5,000+	Chennai, Coimbatore, Madurai	~75%	Chennai generates a significant amount, with ongoing improvements.
Delhi	10,000+	Delhi	~90%	High generation rate with considerable waste-to-energy projects.
West Bengal	4,000-5,000	Kolkata, Howrah, Siliguri	~70%	Waste segregation and collection are inconsistent in some areas.
Karnataka	4,500+	Bangalore, Mysore	~85%	Bangalore is a key contributor; waste-to-energy plants in operation.
Andhra Pradesh	3,000+	Visakhapatnam, Vijayawada	~70%	Some areas have faced issues with improper waste disposal.
Gujarat	3,000+	Ahmedabad, Surat, Vadodara	~80%	Strong municipal waste management, especially in large cities.
Rajasthan	2,500+	Jaipur, Udaipur	~75%	Increasing awareness but facing challenges in rural areas.
Madhya Pradesh	2,000+	Indore, Bhopal	~80%	Indore is one of India's cleanest cities, with successful waste management.

State/Union Territory	Estimated Daily Waste Generation (Tonnes)	Major Cities	Collection Efficiency	Remarks
Bihar	2,000+	Patna	~65%	Low collection efficiency in some areas due to infrastructure gaps.
Kerala	2,000+	Kochi, Thiruvananthapuram, Kozhikode	~80%	High level of public awareness and waste segregation initiatives.
Haryana	2,500+	Gurugram, Faridabad	~85%	Urban areas have good collection systems but rural areas face challenges.
Punjab	2,000+	Amritsar, Ludhiana	~70%	Mixed waste management performance; urban areas fare better.
Odisha	1,500+	Bhubaneswar, Cuttack	~70%	Improving waste management but still struggling in some regions.
Chhattisgarh	1,000+	Raipur, Bilaspur	~75%	Waste management improving in cities, but rural areas need attention.
Jharkhand	1,000+	Ranchi, Jamshedpur	~70%	Struggling with both collection and segregation.
Himachal Pradesh	500-1,000	Shimla, Manali	~70%	Low population density but waste management remains a challenge.
Goa	500+	Panaji, Margao	~75%	Tourism leads to higher waste generation, with good segregation efforts.
Uttarakhand	500+	Dehradun, Nainital	~70%	Growing waste management systems in urban areas.
North Eastern States (Assam, Nagaland, etc.)	500-1,000	Guwahati, Imphal, Kohima	~60%	Varies by state; often lag behind in collection infrastructure.

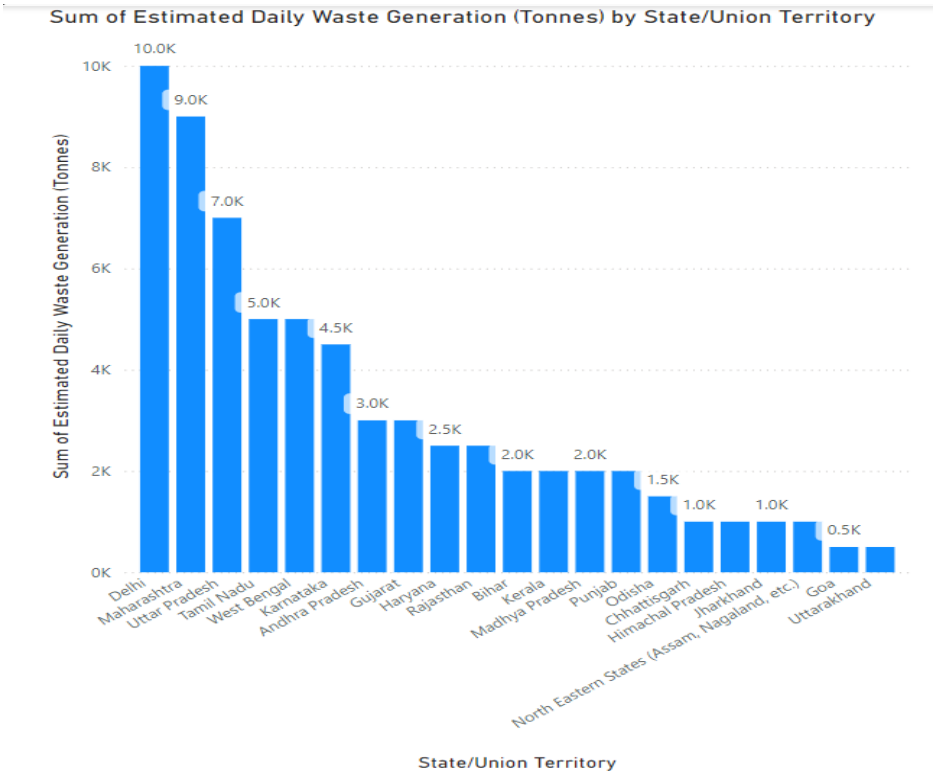
Visualization Of Indian State

1)Efficiency of Collection of Waste



In India, the efficiency of waste collection varies significantly across states, with Delhi leading in high efficiency and North Eastern states showing comparatively lower performance. Delhi's efficient waste management practices likely result from robust infrastructure, organized systems, and strict regulatory enforcement. Metropolitan cities generally have better waste collection and disposal due to larger budgets, higher population density, and more advanced waste management programs. Conversely, the North Eastern states, often with challenging geography, lower population density, and limited access to resources, face difficulties in maintaining consistent waste collection services. This disparity underlines the need for tailored waste management solutions to improve efficiency across regions, particularly in resource-constrained areas. Fostering partnerships, increasing funding, and adopting context-specific strategies could help bridge this gap and enhance waste management across the country.

2) Estimation of daily waste in Each State



In India, Delhi leads with the highest daily waste collection, attributed to its large urban population, well-established waste management systems, and efficient collection processes. The city's organized infrastructure and high waste generation due to dense population drive significant daily collection volumes. In contrast, Uttarakhand records the lowest daily waste collection. This is likely due to its smaller population, widespread rural areas, and challenging terrain, which limit the ease and frequency of collection. Additionally, Uttarakhand's relatively lower waste generation per capita reduces the overall collection volume. The contrast between Delhi and Uttarakhand emphasizes how urban density, infrastructure, and geographic factors influence waste collection efficiency and highlights the need for adaptable approaches to waste management across diverse regions in India.

3)Major Cities That Contributes Waste

The below table highlights the contribution of specific districts across various Indian states to overall waste collection volumes. It shows that certain districts, often urban or densely populated, significantly contribute to their state’s waste generation. These high-waste districts usually have larger populations and more commercial activity, leading to greater waste output. The data underscores the importance of targeting waste management efforts in these districts to optimize collection and disposal efficiency.

State/Union Territory	Major Cities
Andhra Pradesh	Visakhapatnam, Vijayawada
Bihar	Patna
Chhattisgarh	Raipur, Bilaspur
Delhi	Delhi
Goa	Panaji, Margao
Gujarat	Ahmedabad, Surat, Vadodara
Haryana	Gurugram, Faridabad
Himachal Pradesh	Shimla, Manali
Jharkhand	Ranchi, Jamshedpur
Karnataka	Bangalore, Mysore
Kerala	Kochi, Thiruvananthapuram, Kozhikode
Madhya Pradesh	Indore, Bhopal
Maharashtra	Mumbai, Pune, Nagpur, Thane
North Eastern States (Assam, Nagaland, etc.)	Guwahati, Imphal, Kohima
Odisha	Bhubaneswar, Cuttack
Punjab	Amritsar, Ludhiana
Rajasthan	Jaipur, Udaipur
Tamil Nadu	Chennai, Coimbatore, Madurai
Uttar Pradesh	Lucknow, Kanpur, Varanasi, Agra
Uttarakhand	Dehradun, Nainital
West Bengal	Kolkata, Howrah, Siliguri

Waste Collection Of Tamil Nadu (2023)

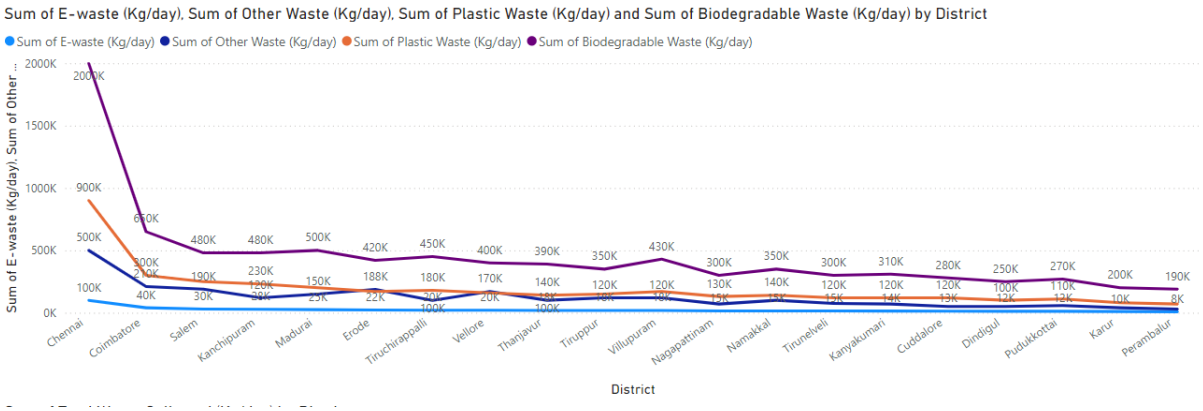
District-Wise Waste Collection

District	Total Waste Collected (Kg/day)	Biodegradable Waste (Kg/day)	Plastic Waste (Kg/day)	E-waste (Kg/day)	Other Waste (Kg/day)
Chennai	3,500,000	2,000,000	900,000	100,000	500,000
Coimbatore	1,200,000	650,000	300,000	40,000	210,000
Madurai	1,000,000	500,000	200,000	25,000	150,000
Tiruchirappalli	850,000	450,000	180,000	20,000	100,000
Salem	950,000	480,000	250,000	30,000	190,000
Tirunelveli	600,000	300,000	120,000	15,000	75,000
Vellore	750,000	400,000	160,000	20,000	170,000
Erode	800,000	420,000	170,000	22,000	188,000
Tiruppur	700,000	350,000	150,000	18,000	120,000
Dindigul	500,000	250,000	100,000	12,000	50,000

District	Total Waste Collected (Kg/day)	Biodegradable Waste (Kg/day)	Plastic Waste (Kg/day)	E-waste (Kg/day)	Other Waste (Kg/day)
Kanchipuram	950,000	480,000	230,000	28,000	120,000
Kanyakumari	600,000	310,000	120,000	14,000	70,000
Pudukkottai	550,000	270,000	110,000	12,000	58,000
Nagapattinam	650,000	300,000	130,000	15,000	70,000
Karur	400,000	200,000	80,000	10,000	40,000
Villupuram	850,000	430,000	170,000	18,000	120,000
Namakkal	700,000	350,000	140,000	15,000	100,000
Cuddalore	600,000	280,000	120,000	13,000	50,000
Thanjavur	750,000	390,000	140,000	18,000	100,000
Perambalur	400,000	190,000	70,000	8,000	30,000

Visualization Of Waste Collection Tamil Nadu in District Wise

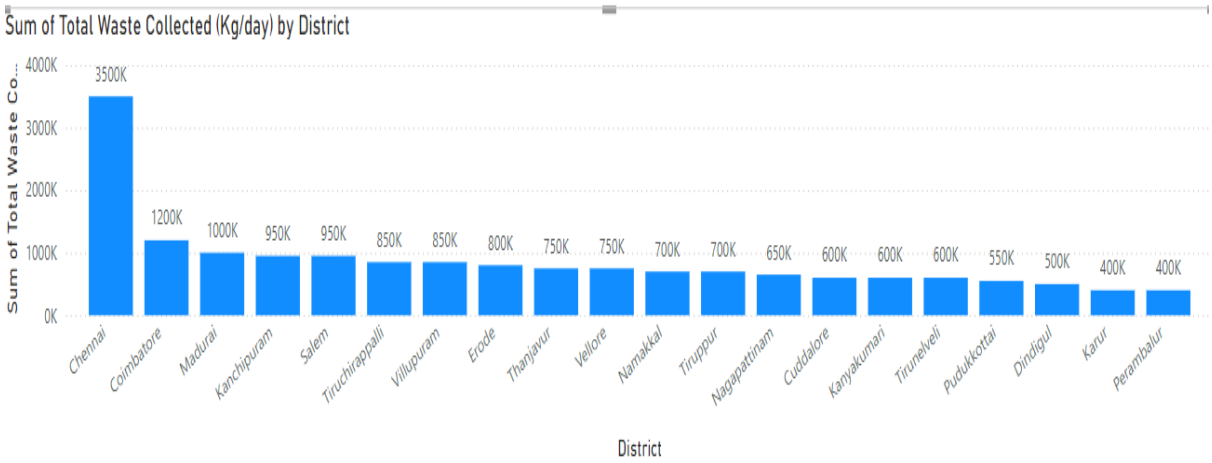
1) Sum of Different Types of Waste collected in a District



The visualization illustrates daily waste collection data across various districts in Tamil Nadu, categorizing it into types: Biodegradable Waste, Plastic Waste, E-waste, and Other Waste. It reveals that biodegradable waste typically forms the largest portion, reflecting widespread organic waste generation from households and food-related industries. Plastic waste is also prevalent, especially in urban areas, due to high consumption of single-use plastics and packaging. E-waste, although less in volume, indicates growing electronic

consumption and disposal trends, particularly in developed districts. "Other Waste" includes a mix of non-organic, construction, and industrial waste types, showing variation depending on district-specific activities. This breakdown highlights the need for specialized waste management strategies for each type to enhance recycling, disposal efficiency, and environmental impact mitigation. Addressing waste categories at the district level can lead to more tailored and effective waste management solutions.

2) Sum of Waste Collected in Each District of Tamil Nadu



In Tamil Nadu, Chennai ranks highest in daily waste collection due to its large population, urban density, and commercial activity, resulting in significant waste generation. As the state's capital, Chennai has well-developed waste management systems, with extensive collection networks handling various waste types, from household to industrial. In contrast, Perambur records the lowest waste collection in Tamil Nadu, likely due to its smaller population and lower waste output. The disparity between Chennai and Perambur showcases how population size, urbanization, and economic activities influence waste volumes across districts. Chennai’s high waste output underscores the need for efficient processing and disposal systems, while Perambur’s lower waste generation highlights the different challenges and needs within Tamil Nadu's waste management framework. Tailored strategies for each area would enhance efficiency and sustainability in waste collection and processing.

Explanation of Waste Types:

1. **Biodegradable Waste**: Includes organic waste like food scraps, garden waste, etc.
2. **Plastic Waste**: Includes all forms of plastic like bags, bottles, wrappers, etc.
3. **E-waste**: Includes discarded electronics like old phones, laptops, batteries, etc.
4. **Other Waste**: Includes other waste categories like construction debris, hazardous waste, textiles, etc.

The waste produced in India has significant implications not only for the country itself but also for the world. India's rapid urbanization, population growth, and industrialization have led to a rise in waste generation. This waste impacts the global environment, public health, and economies in several ways. Below, I'll explain how the waste produced in India affects the world in various forms:

1. Environmental Impact

- **Plastic Pollution**: India is one of the largest contributors to plastic waste, much of which ends up in landfills, rivers, and oceans. The mismanagement of plastic waste leads to **marine pollution**, affecting ecosystems worldwide. The Great Pacific Garbage Patch, for instance, contains large amounts of plastic debris from various countries, including India. Marine life across the globe is impacted, as plastics disrupt ecosystems and enter the food chain.
    - **Impact on marine species**: Marine animals, including fish, sea turtles, and seabirds, ingest plastic waste, leading to injury or death. This, in turn, affects the global biodiversity.
    - **Carbon footprint of plastic**: Plastic production and disposal contribute significantly to **carbon emissions**. As plastics are not biodegradable, their production and incineration release greenhouse gases, contributing to climate change.
- **Landfill Overflow and Land Degradation**: India is running out of proper landfill spaces as waste management systems struggle to cope with the growing amount of waste. Overflowing landfills release toxic gases like **methane**, which is a potent greenhouse gas. Poor waste disposal

practices lead to contamination of soil and groundwater, impacting both local and global food systems.

- **Air Pollution**: In India, open burning of waste, including plastic and other non-biodegradable materials, releases **toxic pollutants** such as dioxins and furans into the atmosphere. These pollutants contribute to **global air pollution** and affect air quality worldwide, especially in neighbouring countries.
    - **Climate Change**: The release of methane and other greenhouse gases from landfills and waste incineration contributes to global warming. Methane has a much higher global warming potential (GWP) than carbon dioxide over a short time frame.

2. Health Impact

- **Toxic Exposure**: Poorly managed waste exposes people to hazardous chemicals and pathogens. E-waste, for example, contains heavy metals like **lead**, **mercury**, and **cadmium**, which leach into the environment and spread across borders via air and water currents. These toxins harm both human health (through contaminated food, water, and air) and the health of wildlife.
    - **Global health risks**: Inhaling toxic fumes from burning waste or drinking contaminated water affects global health outcomes, especially in regions with less access to healthcare.
- **Spread of Disease**: Waste management problems in India often result in **unsanitary conditions** that breed disease-carrying vectors like mosquitoes. Diseases like **malaria**, **dengue**, and **chikungunya** are more likely to spread in areas with poor waste management, and these diseases can spread globally through travel and trade.

3. Economic Impact

- **Global Supply Chain Disruption**: India's waste management issues can affect global supply chains, particularly in industries like textiles, electronics, and manufacturing. For example, the improper disposal of **e-waste** can lead to the loss of valuable materials (e.g., precious metals like gold, silver, and copper), affecting the global recycling market.
- **Tourism and Global Trade**: Pollution from waste, especially in popular tourist destinations like Goa, Kerala, and parts of Tamil Nadu, can reduce the appeal of these regions for international tourists. This affects the global tourism industry and local economies. Additionally, countries

dealing with the effects of waste pollution may have to spend more on environmental cleanup, which diverts resources from other development priorities.

4. Contribution to Global Warming

- **Methane Emissions from Landfills**: India's waste sector contributes significantly to **methane emissions**. Landfills in India emit large amounts of methane—a greenhouse gas 25 times more potent than CO_2. These emissions contribute to global **climate change** by increasing the concentration of greenhouse gases in the atmosphere.
- **Carbon Emissions from Incineration**: In some regions of India, waste is incinerated, releasing **carbon dioxide** and other pollutants into the atmosphere. The release of these gases accelerates global warming and exacerbates the climate crisis.

5. Global Waste Trade

- **Export of E-Waste**: India is one of the largest destinations for e-waste imports, much of it coming from developed countries. While some of this e-waste is recycled, large amounts are dismantled informally, exposing workers to hazardous substances. The improper handling of e-waste in India contributes to the global pollution problem.
    - **Transboundary Waste Movement**: According to the Basel Convention, countries are supposed to regulate the movement of hazardous waste across borders. However, illegal trade in hazardous waste, including e-waste and plastic waste, continues to be a significant problem. India's role as both a source and destination of global waste exacerbates environmental issues worldwide.

6. Contribution to Global Recycling Challenges

- **Low Recycling Rates**: India's waste management infrastructure is still developing, and recycling rates remain low, especially for **plastics**, **e-waste**, and **metals**. This means that valuable materials are often lost in landfills or incinerated rather than being reused.
    - **Global resource depletion**: The failure to properly recycle and reuse materials leads to increased demand for raw materials, contributing to **global resource depletion** and environmental degradation from mining and deforestation.

7. Cultural and Social Impact

- **Cultural Exchange of Practices**: As India is both a producer and a destination for waste, the waste problems in the country can influence global waste management practices. For instance, Indian urbanization and industrialization have influenced how waste is managed in rapidly urbanizing regions across the world. Best practices from India's waste-to-energy plants or plastic recycling initiatives are increasingly being shared globally.
- **Social Inequality**: Informal waste collection and recycling practices in India often expose marginalized communities to hazardous working conditions. These communities may engage in global supply chains that process materials for international markets (e.g., recycling of plastics or electronics), contributing to **social inequality** on a global scale.

Impact of waste on India

- The smoke from the chimneys of the industries emits hazardous amounts of smoke and dust into the air, which leads to air pollution. This polluted air is responsible for various airborne diseases such as asthma.
- The industrial waste dumped in the rivers results in the loss of aquatic life. These wastes form a layer over the river water and cut down the oxygen advancing the sea animals and plants, resulting in the death of these plants and animals. This phenomenon is called Eutrophication.
- Various landfills are created due to the dumping of garbage, and large areas of land are created to make new landfills in order to dump the same. The government should rather utilise the already created landfills and treat waste properly than create new ones.
- Wastes dumped in areas when not treated start smelling, which cause the breeding of mosquitoes. These mosquitoes become the reason for diseases later on.
- Plastic dumped as waste cannot decompose but increases underground pressure, resulting in earthquakes.
- Plastic dumped as waste can also be consumed by animals, resulting in internal injury or deaths of animals.
- Collected wastes lead to the emission of greenhouse gases, which increase the amount of carbon dioxide in the atmosphere, resulting in the heating up of our environment. This has resulted in climate change.

- Improper waste dumping leads to soil contamination. This contaminated soil cannot be used for growing trees.
- Plastic that is not decomposed releases a harmful chemical called DEHA (DIETHYLHYDROXYLAMINE), which causes immense harm to human health like liver dysfunction, loss of weight and hurt reproductive capabilities of a human.
- When rainfall occurs, it combines with toxic substances in the air and becomes acidic. This acid rain causes harm to marine life as well as humans.