



## **SOLID WASTE MANAGEMENT POLICY IN RURAL AREAS OF UTTAR PRADESH**



### **THE OVERALL GOAL OF THIS POLICY IS TO ENSURE**

**“The system for Managing Solid Wastes in Rural Uttar Pradesh should be environmentally safe, sustainable and financially viable, leading to improved quality of life.”**

**PANCHAYAT RAJ DEPARTMENT  
GOVERNMENT OF UTTAR PRADESH**

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## BRIEF PROFILE OF UTTAR PRADESH

- 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 the most populous state in India consisting of 19.98 crore (199.8 million) inhabitants as per 2011 Census, out of which 155.3 million live in rural areas and 44.4 million in urban areas.
- The population density is 828 people per square kilometre, making it one of the most densely populated states in the country. The state's 2001–2011 decennial growth rate (including Uttarakhand) was

20.09%

- Percentage of rural population to total population of the State stands at 77.72% as per 2011 Census whereas; this percentage was 79.22 in 2001.
- The sex ratio in 2011, at 912 women to 1000 men, was lower than the national figure of 943.
- However, the level of urbanization (22.28%) in the State is quite low as compared to all India figures of 31.16% and Rural population being 68.84%
- Administratively Uttar Pradesh is divided into 75 districts under 18 divisions. The 18 divisions are Agra, Aligarh, Azamgarh, Allahabad, Kanpur, Gorakhpur, Chitrakoot Dham, Jhansi, Devi Patan, Faizabad, Bareilly, Basti, Vindhyachal (Mirzapur), Moradabad, Meerut, Lucknow, Varanasi and Saharanpur.
- Panchayat Raj Institutions as well as the functioning of the Department of Panchayati Raj are governed by the two State Panchayat Acts viz.,
  - UP Panchayati Raj Act 1947 and,
  - UP Kshettra Panchayat and Zila Panchayat Act 1961.
- As per two State Panchayat Acts there is a 3 tier PRI system as follows:
  - Zila Panchayat at District Level
  - Kshettra Panchayat at Intermediary (Block) level
  - Gram Panchayat at the Village level
- Elections are held at regular intervals of 5 years period, under the superintendence of State Election Commission since 1995.
- At present there are 75 Zila Panchayats, 826 Kshettra Panchayats and 58194 Gram Panchayats in the state. Population wise breakup of Gram Panchayats is given under:

Sl.No	Population	Number of Gram Panchayats
1	< 2000	26134
2	2001 - 5000	27839
3	5001 - 10000	3669
4	10000 & >	552
	<b>TOTAL</b>	<b>58194</b>

- 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.

## INTRODUCTION TO SOLID WASTE MANAGEMENT

Solid Waste Management (SWM) is an organized process of collection, storage, transportation, processing and disposal of solid refuse residuals in an engineered sanitary landfill. Solid Waste Management (SWM) includes all activities that seek to minimize the health, environment and aesthetic impacts of solid wastes. It is an integrated process comprising several collection methods, varied transportation equipments, storage, recovery mechanisms for recyclable material, reduction of waste volume and quantity by methods such as composting, waste-to-energy and disposal in a designated engineered sanitary landfill.

The selection of a suitable SWM process is driven by the source and quality of waste produced. Solid waste is generated from a number of sources which include households (kitchen and yards), commercial areas (shops, hotels, and restaurants), industries (raw material and packaging), institutions (schools, hospitals, and offices), construction and demolition sites, wild and domesticated animals (carcasses of dead animals, manure), parks (fallen branches, leaves from trees) and streets (sand, silt, clay, concrete, bricks, asphalt, residues from air deposition and dust).

To tackle the adverse impact of uncontrolled waste generation, its handling and disposal, the Government of India has made the "Solid Waste Management Rules, 2016". And they apply to every urban local body, outgrowths in urban agglomerations, census towns as declared by the Registrar General and Census Commissioner of India, notified areas, notified industrial townships, areas under the control of Indian Railways, airports, airbases, Ports and harbours, defence establishments, special economic zones, State and Central government organisations, places of pilgrims, religious and historical importance as may be notified by respective State government from time to time and to every domestic, institutional, commercial and any other non residential solid waste generator situated in the areas except industrial waste, hazardous waste, hazardous chemicals, bio medical wastes, e-waste, lead acid batteries and radio-active waste, that are covered under separate rules framed under the Environment (Protection) Act, 1986.

**As per Point-13 of these Rules the Duties of the Secretary-in-charge of Village Panchayats or Rural Development Department in the State and Union territory, are spelt out as :**

- **The Secretary-in-charge of Village Panchayats or Rural Development Department in the State and Union territory shall have the same duties as the Secretary-in-charge, Urban Development in the States and Union territories, for the areas which are covered under these rules and are under their jurisdictions.**

Hence this Policy on Solid Waste Management for the Gram Panchayats which are part of, outgrowths in urban agglomerations, census towns as declared by the Registrar General and Census Commissioner of India, notified areas, notified industrial townships, areas under the control of Indian Railways, airports, airbases, Ports and harbours, defence establishments, special economic zones, State and Central government organisations, places of pilgrims, religious and historical importance as may be notified by respective State government from time to time and to every domestic, institutional, commercial and any other non residential solid waste generator situated in the areas except industrial waste, hazardous waste, hazardous chemicals, bio medical wastes, e-waste, lead acid batteries and radio-active waste, that are covered under separate rules framed under the Environment (Protection) Act, 1986.

In order to prepare this Policy available studies and reports on waste management in rural Uttar Pradesh were searched. We found some studies done with the support of UNICEF which had quantification of waste, but they were limited to only to broad categories like biodegradable, non- biodegradable and hazardous , whereas we required further sub categories data like:

Sr. No.	Waste Type	Sub-Category & Type
1.	Bio-degradable Waste	Mostly green waste from the kitchen and animal waste
2.	Recyclable Waste	Plastic, Wood, Thermocol, Glass, Tin, Metal etc.
3.	Hazardous Waste	Diapers, Sanitary Napkins, Small batteries, unused medicines, syringes etc.
4.	Inert Waste	Mostly Mud and Dust

Further it was not clear in these studies about number of days of data collection. To overcome these shortfall it was decided to conduct a study to Characterize & Quantify the waste.

To Characterize & Quantify the waste RCUES, Lucknow conducted a survey of Solid Waste in Gram Panchayats of Uttar Pradesh. For the above purpose 4 districts had been selected from each region i.e. north, east, central and west.

- Gorakhpur
- Saharanpur
- Lucknow
- Jhansi

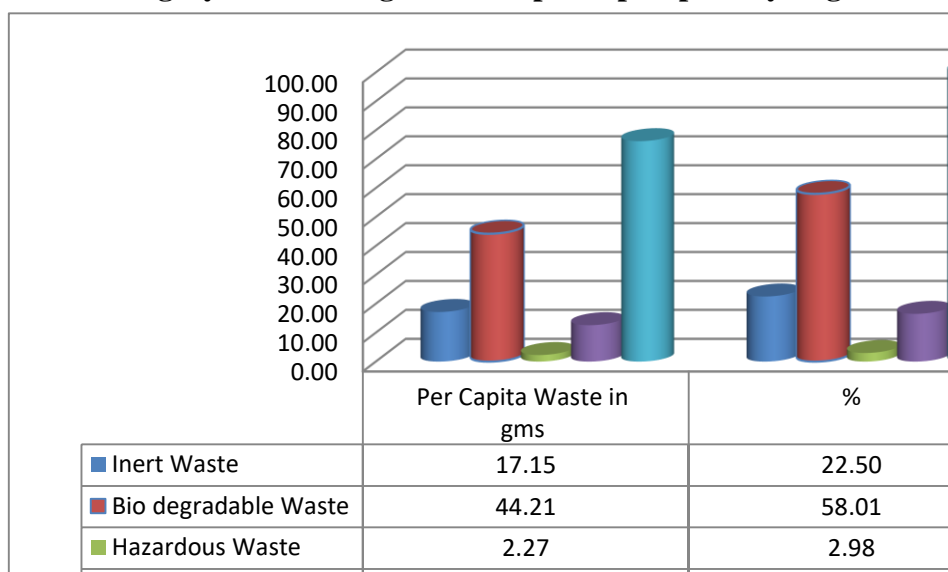
In the above districts 4 Gram Panchayats of each district were surveyed. From the selected Gram Panchayat, the sample was as under:

1. Gram Panchayat with more than 10000 population 300 households were surveyed.
2. Gram Panchayat with 5000-10000 population 150 households were surveyed.
3. Gram Panchayat with 2000-5000 population 100 households were surveyed.
4. Gram Panchayat with less than 2000 population 50 households were surveyed.

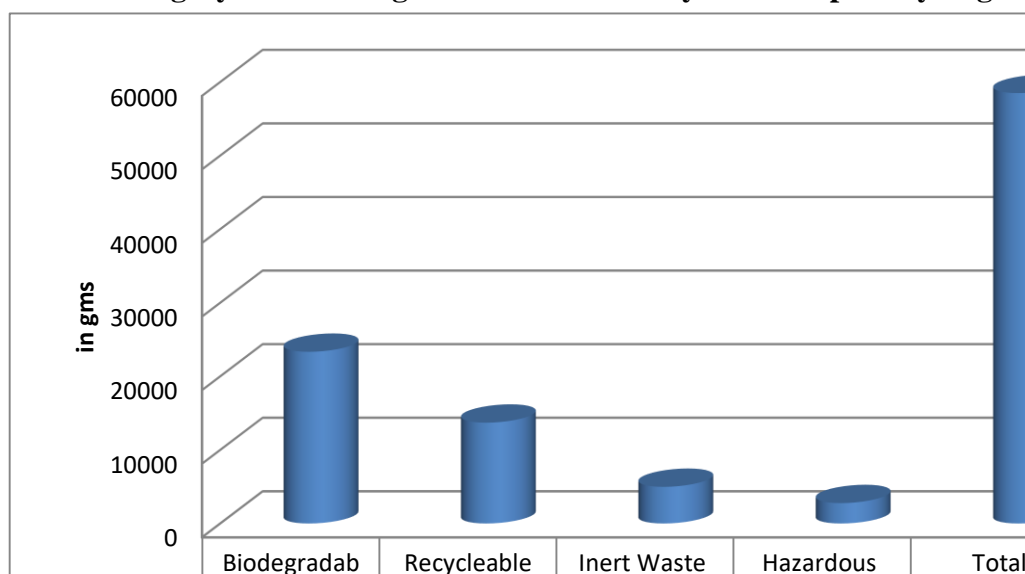
The selection of Gram Panchayats was done in consultation with the District authorities and in order to get the data of waste generated and its type at the weekly markets, survey of one weekly market was done at each District.

In each of the Gram Panchayats 7 days data from each household (Solid Waste) and one weekly market Waste data was collected and analysed. After the analysis following results emerged: (For Details Refer Annexure 1)

**Category wise waste generation per capita per day in gms**



**Category wise waste generation for Weekly Markets per day in gms**



**AT A GLANCE STRATEGY OF SOLID WASTE MANAGEMENT AT GRAM PANCHAYAT**

- **Category-A**

- For the Gram Panchayats which are part of, outgrowths in urban agglomerations, census towns as declared by the Registrar General and Census Commissioner of India, notified areas, notified industrial townships, areas under the control of Indian Railways, airports, airbases, Ports and harbours, defence establishments, special economic zones, State and Central government organisations, places of pilgrims, religious and historical importance as may be notified by respective State government from time to time and to every domestic, institutional,

**commercial and any other non-residential solid waste generator situated in the areas, and all the Gram Panchayats with more than 10000 population.**

- Segregation of waste at household level/ establishment level- two bin system (organic and recyclable).
- Encourage the households, if land available with them, to construct a small pit/earthen post composting for biodegradable waste and compost can be used by them.
- Door to door collection- by private party or the Gram Panchayat;
- Collection vehicles/ carts to have two bin systems.
- At secondary collection point two bins to be kept.
- Transportation to be in vehicles with Partition and cover, to the material recovery centre to be established by the Gram Panchayat.
- Bio-degradable waste to be sent to vermi-composting unit/community composting pit/windrow composting - to be established at Gram Panchayat level and managed by local SHGs or local entity.
- Local rag-pickers and kabariwalas to be roped-in for segregation and paid out of the sale of recyclables.
- All Sanitary Napkins and Diapers should be given for incineration at the facility made at the women and child friendly CSE being developed at each Gram Panchayat.
- If no nearby Industry is available than RDF material to be sent to nearest big ULB/ Point designated by the District Authority to be further sent to Industry. Or District Authority may Facilitate setting up of unit to make Pallets at the District, so that it could be sold to the PWD Deptt or the Road Construction contractor in Road Making.
- Balance inert waste to be sent to nearest Landfill site for which district authorities to make arrangements (Not more than 10%).

**All Gram Panchayats should make By Laws regarding:**

- Segregation of Waste at Source.
- Prohibiting Littering of Waste.
- Prohibiting Burning of Waste.
- Banning Open Defecation.
- Banning Open Transportation of Waste.
- Prohibiting Disposal of Waste in Open Drains and water bodies.

**• Category-B**

**○ All other Gram Panchayats with less than 10000 population.**

- Segregation of waste at household level/ establishment level- two bin system (organic and recyclable).
- Encourage the households, if land available with them, to construct a small pit/earthen post composting for biodegradable waste and compost can be used by them.
- At secondary collection point two bins to be kept and households dispose the waste in the designated bins as per type of waste. The distance of such bins should be such that they cover maximum 50 households.
- Transportation to be in vehicles with Partition and cover, to the material recovery centre to be established by the Gram Panchayat.



- Bio-degradable waste to be sent to vermi-composting unit/community composting pit/windrow composting - to be established at Gram Panchayat level and managed by local SHGs or local entity.
- All Sanitary Napkins and Diapers should be given for incineration at the facility made at the women and child friendly CSE being developed at each Gram Panchayat.
- If no nearby Industry is available than RDF material to be sent to nearest big ULB/ Point designated by the District Authority to be further sent to Industry (once or twice a month as per requirement). Or District Authority may Facilitate setting up of unit to make Pallets at the District, so that it could be sold to the PWD Deptt or the Road Construction contractor in Road Making.
- Balance inert waste to be sent to nearest Landfill site for which district authorities to make arrangements (Not more than 10%).

## VISION OF THE POLICY

The vision which this Policy seeks to pursue is:

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**A healthy, prosperous and resource-efficient society, in which wastes are minimized, reduced, reused and recycled wherever feasible and beneficial, and disposed-off in environmentally safe manner.**

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## THE OVERALL GOAL OF THIS POLICY IS TO ENSURE

**“The system for Managing Solid Wastes in Rural Uttar Pradesh should be environmentally safe, sustainable and financially viable, leading to improved quality of life.”**

## GOALS & OBJECTIVES OF THE POLICY

The primary objectives of this Policy are to:

1. Achieve high standards of cleanliness in the Gram Panchayats of Uttar Pradesh for healthy, hygienic and liveable environment.
2. Emphasis will be on waste reduction, reuse, recycling, recovery and optimum utilization of various components of Solid Waste to ensure minimization of waste going to the landfill and its impact on human health and environment. The strategy will inter alia include technology options for waste to compost and waste to energy recovery.



3. The Policy for managing solid wastes is developed to facilitate preparation, implementation and operation of a decentralized / integrated and cost-effective Solid Waste Management System in the rural areas of the state.
4. Ensuring end-use or reuse of recovered waste resources (high value recyclables, low value recyclables, compost, combustible material (RDF) to waste to energy users, either through partnerships, sale or reuse at the local level.
5. Available data and information on the sources, nature, quantities and fate of wastes, and SWM facilities, is sufficiently comprehensive and reliable to be able to regulate and manage wastes effectively helping in waste minimization, recovery and recycling.
6. Stakeholders, institutions and organisations must have a sufficient awareness and understanding of their roles, duties and responsibilities in achieving an optimal development and operation of a decentralized/ integrated and cost-effective solid waste management system.

## **GUIDING PRINCIPLES FOR SOLID WASTE MANAGEMENT APPROACH IN RURAL UTTAR PRADESH**

Scientific disposal of solid waste through segregation, collection, treatment and disposal in an environmentally sound manner minimises the adverse impact of waste on the environment. The Gram Panchayats/ Blocks/ District shall be responsible for development of infrastructure for collection, storage, segregation, transportation, processing and disposal of Solid Waste. The Uttar Pradesh Rural Solid Waste Management Policy is based on following principles:

- **Reduction and reuse of waste at source:** The Gram Panchayats will promote the options for minimization by promoting reuse. It will be helpful in reducing the handling, treatment, and disposal costs and specially reduce various environmental impacts such as leachate, air emissions and generation of greenhouse gases.
- **Waste to composting:** As far as possible the organic portion of waste shall be composted and used to improve soil health and agricultural production.
- **Waste recycling:** Recovery of recyclable material resources through a process of segregation, collection and re-processing to create new products shall be the next preferred alternative.
- **Waste-to-Energy Recovery:** Where material recovery from waste is not possible, Bio-methanation, plastics to oil, waste to pellets, waste incineration and production of Refuse Derived Fuel (RDF) and co-processing of the sorted dry rejects from solid waste may be adopted.
- **Waste disposal:** Remaining residual waste, which are ideally comprised of inerts, shall be disposed in sanitary landfills constructed in accordance with stipulations of the Solid Waste Management Rules, 2016. It should be targeted that minimal waste reaches to Landfill site (not more than 10%).
- **Effective segregation at source-** Two bin and segregation at sources and also at the processing units. The domestic hazardous wastes like battery, blade, razors etc. should be collected and handled separately.
- Implementation of effective ban on production, sale and use of plastic carry bags with thickness less than 50 microns.
- Integration of informal sector. Gram Panchyat Should Identify Informal Sectors, issue identity cards to the rag pickers and integrate them.
- The integrated Solid Waste Management system shall be environment friendly. Waste minimization, waste recycling, waste-to-energy recovery strategies and landfill gas

capture and use which are promoted in the Solid Waste Management Rules, 2016 are strategies for reduction of greenhouse gases.

- Adequate decentralized waste management system to be promoted.
- 100% collection of segregated waste at fixed time 365 days in a year and ensuring that it does not touches the ground once it is collected from the household.
- Timely transportation of segregated waste.
- Maximum resources recovery – establishing material recovery centres in wards.
- Polluters to pay – The Gram Panchayats should impose a fine amount, say for littering Rs. 1000 and for manufacturing, sale and use of banned polythene bags Rs. 50,000.
- Daily Road sweeping and open drain cleaning.
- Social and health insurance for rag pickers.
- IEC activities should be in local language and pictorial wall writing and slogans should be there for effective implementation of Solid Waste Management.
- Capacity Building of citizens and public representative should be conducted on regular intervals
- Effective IEC and Capacity Building.

## **ROLES & RESPONSIBILITIES OF STAKE HOLDERS**

### **I. Roles & Responsibilities of Waste Generator: -**

1. Every waste generator shall:
  - Segregate and store the waste generated by them in two separate streams namely biodegradable, non-bio-degradable and domestic hazardous wastes in suitable bins and handover segregated wastes to authorised waste pickers or waste collectors as per the directions or notification by the local authorities from time to time. For this purpose Gram Panchayat shall notify three colour schemes for the dust bins.
  - Wrap securely the used sanitary waste like diapers, sanitary pads etc., in the pouches provided by the manufacturers or brand owners of these products or in a suitable wrapping material as instructed by the local authorities and shall place the same in the bin meant for dry waste or non-bio-degradable waste;
  - Shops, commercial establishments and businesses should store segregated waste onsite.
  - Store separately construction and demolition waste, as and when generated, in own premises and Gram Panchayat shall dispose-off as per the Construction and Demolition Waste Management Rules, 2016 ; and
  - Store horticulture waste and garden waste generated from premises separately in own premises and dispose of as per the directions of the Gram Panchayat from time to time.
2. No waste generator shall throw, burn or burry the solid waste generated by him/her, on streets, open public spaces outside his premises or in the drain or water bodies.
3. All waste generators shall pay such user fee for solid waste management, as specified in the bye-laws of the Gram Panchayat.
4. No person shall organise an event or gathering of more than one hundred persons at any unlicensed place without intimating the Gram Panchayat, at least three working days in advance and such person or the organiser of such event shall ensure segregation of waste at source and handling over of waste to waste collector or agency as specified by the Gram Panchayat.

5. Every street vendor shall keep suitable containers for storage of waste generated during the course of his / her activity such as food waste, disposable plates, cups, cans, wrappers, leftover food, vegetables, fruits, etc., and shall deposit such waste at waste storage depot or container or vehicle as notified by the Gram Panchayat.

## II. Roles & Responsibilities of District Magistrate:-

1. Facilitate identification and allocation of suitable land as per clause (f) of rules 11 of Solid Waste Management Rules, 2016 for setting up decentralized solid waste processing and disposal facilities to local authorities in his district in close coordination with the Secretary-in-charge of State Panchayati Raj Department.
2. The arrangement for land for processing of Solid Waste (Composting & MRF Centre) at every Gram Panchayat and for disposal of solid waste (Inert and Hazardous) in every District should be arranged.
3. Review the performance of Gram Panchayats, at least once in a quarter on waste segregation, processing, treatment and disposal and take corrective measures in consultation with the Commissioner or Director of Panchayati Raj and Secretary-in-charge of the State Panchayati Raj Department.
4. Facilitate setting up of waste to energy processes including refused derived fuel for combustible fraction of waste or supply as feedstock to solid waste based power plants or cement kilns; unit to make Pallets at the District, so that it could be sold to the PWD Deptt or the Road Construction contractor in Road Making (Refer Annexure 2)
5. Districts to develop their Sanitary Land Fill sites through District Planning Committee (DPC). The site will be maintained by private players.

## III. Roles & Responsibilities of Gram Panchayats:-

### ➤ **By Laws to be made and strengthening of the organisational structure:**

1. Gram Panchayats should prepare a byelaw to prohibit littering and burning of waste with penalty. This penalty for littering should be minimum Rs.1000 and for manufacturing, sale and use of prohibited polythene bags (thickness less than 50 micron) to Rs. 50.000.
2. Gram Panchayats should prepare a byelaw for collection and segregation of waste, specifying user charges.
3. The Gram Panchayats can also engage private operators for waste collection and processing, where the operator can negotiate the user charges with the household owners or establishments.
4. Constitute a Swachhata Protsahan Committee at the Gram Panchayat level.
5. Prepare a solid waste management plan as per State policy within six months from the date of notification of State policy and submit a copy to the State Government.
6. Register and issue photo I-cards to all rag pickers.

### ➤ **Primary Collection:**

1. Will ensure source segregation of waste, to channelize the waste to wealth by recovery, reuse and recycle. Two bin System shall be followed ( Green Waste, Dry Waste, Hazardous Waste).
2. Establish a system to recognise organisations of waste pickers or informal waste collectors and promote and establish a system for integration of these informal waste-

- pickers and waste collectors to facilitate their participation in solid waste management including door to door collection of waste;
3. Facilitate formation of Self Help Groups, and thereafter encourage integration in solid waste management including door to door collection of waste;
  4. Directions and education to safai karmi and others not to burn solid waste, tree leaves collected from street sweeping and store them separately and handover to the waste collectors or agency authorised by Gram Panchayat;
  5. Collect waste from vegetable, fruit, flower, meat, poultry and fish market on day to day basis or market days and promote setting up of decentralised compost plant or bio-methanation plant at suitable locations in the markets or in the vicinity of markets ensuring hygienic conditions;
  6. Establish a system to collect waste from mandis, vegetable and fruit market for taking it to kanha gaushalas. Develop a linkage with agricultural and horticultural institutes of Government of India or State Government with kanha gaushals for supply of manure to these institutions in lieu of fodder and feed for animals.
  7. Used sanitary waste like diapers, sanitary pads should be wrapped securely in pouches provided by manufacturers or brand owners of these products or in a suitable wrapping material and shall place the same in the bin meant for domestic hazardous waste. Gram Panchayats may an enclosure where this waste can be dried and then shredded, and then it could be used as RDF.
  8. Bulk and institutional generators, market associations, event organizers and hotels and restaurants will be made directly responsible for segregation and sorting the waste and manage the same in partnership with Gram Panchayats.

**Some of the responsibilities only for Gram Panchayats of Category-A are given under:**

9. Gram Panchayats may arrange for door to door collection of segregated solid waste from all households including slums and informal settlements, commercial, institutional and other non-residential premises.
10. All hotels and restaurants should segregate biodegradable waste and set up a system of collection or follow the system of collection set up by Gram Panchayat to ensure that such food waste is utilized for composting / bio-methanation.
11. All Resident Welfare and market associations, gated communities and institution with an area >5,000 sq. mt. should segregate waste at source in to valuable dry waste like plastic, tin, glass, paper, etc. and handover recyclable material to either the authorized waste pickers or the authorized recyclers, or to the Gram Panchayat. The bio-degradable waste should be processed, treated and disposed of through composting or biomethanation within the premises as far as possible. The residual waste shall be given to the waste collectors or agency as directed by the Gram Panchayats.
12. New townships and Group Housing societies should be made responsible to develop in-house waste handling, and processing arrangements for bio-degradable waste-through RWA.
13. Every street vendor should keep suitable containers for storage of waste generated during the course of his activity such as food waste, disposable plates, cups, cans, wrappers, coconut shells, leftover food, vegetables, fruits etc. and deposit such waste at waste storage depot or container or vehicle as notified by the Gram Panchayat.
14. Develop a mechanism that Safai karamchari collecting waste should again segregate at household level, they should be allowed to sell the recyclables and keep the amount with them. This will ensure proper segregation.

➤ **Secondary Collection:**

1. Will ensure three bins at every Secondary Collection Point. Which should be maximum for 50 households with a set of two bins.
2. Setup material recovery facilities or secondary storage facilities at every Gram Panchayat with sufficient space for sorting of recyclable materials to enable informal or authorised waste pickers and waste collectors to separate recyclables from the waste. The size and shape of the MRF Centre will vary as per the population and total waste generation. Provide easy access to waste pickers and recyclers for collection of segregated recyclable waste such as paper, plastic, metal, glass, and textile from the source of generation or from material recovery facilities. (Refer Annexure 3)
3. Establish waste deposition centres for domestic hazardous waste and give direction for waste generators to deposit domestic hazardous wastes at this centre for its safe disposal. Such facility shall be established in a Gram Panchayat in a manner that one centre is set up for the area and notify the timings of receiving domestic hazardous waste at such centres; **All Sanitary Napkins and Diapers should be given for incineration at the facility made at the women and child friendly CSE being developed at each Gram Panchayat.**
4. Set up covered secondary storage facility for temporary storage of street sweepings and silt removed from surface drains in cases where direct collection of such waste into transport vehicles is not convenient. Waste so collected shall be collected and disposed of at regular intervals as decided by the Gram Panchayat;

➤ **Transportation of Waste:**

1. Transport segregated bio-degradable waste to the processing facilities like compost plant, bio-methanation plant or any such facility. Preference shall be given for on-site processing of such waste.
2. Transport non-bio-degradable waste to the respective processing facility or material recovery facilities or secondary storage facility;
3. All waste to be transported in segregated form in covered vehicles.
4. ICT technologies should be used for monitoring of vehicle being used in solid waste management like Global Positioning System Technology.

➤ **Processing of Waste:**

1. Facilitate construction, operation and maintenance of solid waste processing facilities and associated infrastructure on their own by RWAs or with private sector participation or through any agency for optimum utilisation of various components of solid waste adopting suitable technology including the following technologies and adhering to the guidelines issued by the Ministry of Environment, Forests and Climate Change, Government of India, Ministry of Jal Shakti and Department of Panchayati Raj, Government of U.P. from time to time and standards prescribed by the Central Pollution Control Board. Preference shall be given to decentralised processing to minimize transportation cost and environmental impacts such as-
  - a) bio-methanation, microbial composting, vermi-composting, anaerobic digestion or any other appropriate processing for bio-stabilisation of biodegradable wastes; **Ideally Vermi-composting should be the first choice.**

➤ **Disposal of Inert Waste:**

1. Stop dumping of mixed waste. Disposal only at designated sanitary landfill site as developed by the District;

2. Allow only the non-usable, non-recyclable, non-biodegradable, non-combustible and non-reactive inert waste and pre-processing rejects and residues from waste processing facilities to go to sanitary landfill. However, every effort shall be made to recycle or reuse the rejects to achieve the desired objective of zero waste going to landfill;

➤ **Other Activities:**

1. Annual action plan made for IEC activities and promote IEC in educational institutions/community level etc.
2. Ban on use of prohibited plastics in daily activities and whatever Plastic wastes generate will be utilized in road construction.
3. Construction and demolition waste should be stored, separately disposed-off as per the Construction and Demolition Waste Management Rules, 2016.
4. Bio Medical waste to be disposed as per Bio Medical Waste Management Rules. The Gram Panchayat shall ensure that no bio medical waste is mixed in waste generated from households, establishments and commercial areas.
5. The developers of Special Economic Zone, industrial estate, industrial park to earmark at least 5% of the total area of the plot or minimum 5 plots / sheds for recovery and recycling facility.
6. All manufacturers of disposable products such as tin, glass, plastics packaging etc. or brand owners who introduce such products in the market shall provide necessary financial assistance to local authorities for the establishment of waste management system.

#### IV. Role & Responsibilities of Zilla Panchayat

1. Shall plan for the fund requirements of Gram Panchayats for Solid Waste Management.
2. Will ensure that a separate space for segregation, storage, decentralized processing of solid waste is demarcated in the development plan for group housing or commercial, institutional or any other non-residential complex exceeding 200 dwelling or having a plot area exceeding 5,000 square meters; Especially in Category-A Gram Panchayats.

#### V. Roles & Responsibilities of State Pollution Control Board- for Category-A Gram Panchayats

1. State pollution control board shall:
  - a) Enforce these rules in their state through Local Bodies in their respective jurisdiction and review implementation of these rules at least twice a year in close coordination with the Directorate of Panchayati Raj or Secretary-in-charge of State Panchayati Raj Department;
  - b) Monitor environmental standards and adherence to conditions as specified under the Schedule -I and Schedule- II for waste processing and disposal sites;
  - c) Examine the proposal for authorization and make such inquiries as deemed fit, after the receipt of the application for the same in Form -I from the Gram Panchayats or any other agency authorized by the District Authority;
  - d) While examining the proposal for authorization, the requirement of consents under respective enactments and views of other agencies like the State Rural Development Department, the Town and Country Planning Department, District Planning Committee or Metropolitan Area Planning Committee, Airport or



- Airbase Authority, the Ground Water Board, Railways, power distribution companies, highway department and other relevant agencies shall be taken into consideration and they shall be given four week time to give their views, if any;
- e) Issue authorization within a period of sixty days in Form -II to the Gram Panchayats or an operator of a facility or any other agency authorized by District Authority stipulating compliance criteria and environmental standards as specified in Schedules -I and II including other conditions, as may be necessary;
  - f) Synchronize the validity of said authorization with the validity of the consents;
  - g) Suspend or cancel the authorization issued under clause (a) any time, if the Gram Panchayat or operator of the facility fails to operate the facility as per the conditions stipulated; provided that no such authorization shall be suspended or cancelled without giving notice to the Gram Panchayat or operator, as the case may be;
  - h) On receipt of application for renewal, renew the authorization for next five years, after examining every application on merit and subject to the condition that the operator of the facility has fulfilled all the provisions of the rules, standards or conditions specified in the authorization, consents or environment clearance.
2. The State Pollution Control Board shall, after giving reasonable opportunity of being heard to the applicant and for reasons thereof to be recorded in writing, refuse to grant or renew an authorization.
  3. In case of new technologies, where no standards have been prescribed by the Central Pollution Control Board, State Pollution Control Board, as the case may be, shall approach Central Pollution Control Board for getting standards specified.
  4. The State Pollution Control Board, as the case may be, shall monitor the compliance of the standards as prescribed or laid down and treatment technology as approved and the conditions stipulated in the authorization and the standards specified in Schedules -I and II under these rules as and when deemed appropriate but not less than once in a year.
  5. The State Pollution Control Board may give directions to local bodies for safe handling and disposal of domestic hazardous waste deposited by the waste generators at hazardous waste deposition facilities.
  6. The State Pollution Control Board shall regulate Inter-State movement of waste.

#### VI. Roles & Responsibilities of Housing & Urban Planning Department:-

3. Ensure that master plan of every city in the State provides for setting up of solid waste processing and disposal facilities and are clearly earmarked, taking into account, the requirement of rural area also.
4. Shall incorporate landfill sites demarcated by the District Authorities in their master plan.
5. Will provide space for sanitary landfill site in Regional Plans;
6. Will provide space for waste to energy plants in their plans as per requirement of the District.

#### VII. Roles & Responsibilities of the Department of Industry

1. Will notify all the Industries of the State to take back the packing material as far as possible, for re use by enforcing extended producers responsibility.
2. Will also direct the Industries of the state, where RDF can be used, to collect RDF material from the nearest Gram Panchayat.(100 km radius)



#### VIII. Roles & Responsibilities of State Rural Development Department:-

1. Shall ensure that all the SHG's, and poors are supporting the initiative of the Gram Panchayat for Solid Waste Management.
2. Shall try and form groups of poor for door to door collection, segregation and running vermi composting plants. For the purpose they shall use the funds under State Gramin Aajivaka Mission and other schemes for training and loan to the poor.
3. Shall support in creation of infrastructure for solid waste management at the Gram Panchayat/ Block/ District level.

#### IX. Roles & Responsibilities of manufacturers or brand owners of disposable products and sanitary napkins and diapers

1. All such brand owners who sell or market their products in such packaging material which are non-biodegradable shall put in place a system to collect back the packaging waste generated due to their production.
2. Manufacturers or brand owners or marketing companies of sanitary napkins and diapers shall explore the possibility of using all recyclable materials in their products or they shall provide a pouch or wrapper for disposal of each napkin or diapers along with the packet of their sanitary products.
3. All such manufacturers, brand owners or marketing companies shall educate the masses for wrapping and disposal of their products.

#### X. Roles & Responsibilities of the industrial units located within one hundred km from the Gram Panchayat

1. All industrial units using fuel and located within one hundred km from a solid waste based refused derived fuel plant shall make arrangements within six months from the date of notification of these rules to replace at least five percent of their fuel requirement by refused derived fuel so produced.



## **CAPACITY BUILDING AND TRAINING**

In context of this policy, it is recognized that there is a need to improve the efficiency of the State departments and the Gram Panchayats across the state through a systematic approach, of which training is an important component. It is understood that capacity development is a long-term process that requires systematic and continuous effort at State as well as District/Block/Gram Panchayat level, both from the demand and supply perspective of service delivery.

The approach to capacity building in SWM shall not only be about technology and economics but also should cover:

- Understanding the administrative systems for waste management and related activities (multidisciplinary and cross-sectoral).
- Understanding the need for human resource development to achieve better results in SWM.
- Focus on building sound institutions, promoting good practices and good governance for attaining improved SWM.
- Delineating strategies for sustenance of achievements.



### IEC (INFORMATION, EDUCATION AND COMMUNICATION)



Solid Waste Management is an activity in which public participation holds the key to success. Implementation of better solid waste management can be achieved only if there is active and effective community participation. Information, Education and Communication (IEC) activities play major role in achieving the success of the implementation of modern SWM. Awareness amongst the community and different stakeholders to meet the demands of the new system for a cleaner environment requires a detailed and thorough understanding at every stage. Involvement of community is going to be the main thrust of the programme. Awareness and education campaigns should target Gram Panchayat/ Block authorities, elected representatives, schools, non-governmental organizations (NGOs), media, trade associations, families and the public at large.

The main objectives of IEC are to make people understand:

- The concept of and need for source segregation,
- The need to store waste at source in two separate receptacles - one for bio degradable and another for recyclable,
- The role of citizens in primary collection of waste from the household and handing over to waste collectors,
- The need to pay for waste collection and disposal services,
- The need to use litter bins on road sides and public places,
- The impact of solid waste on public health and the environment.

The following methods can be used to generate awareness among the public.

- Door to Door awareness and motivation programmes using Pamphlets, brochures, hoardings, banners, handbills, posters, wall writing etc.,
- Organising rallies, swachhata pakhwara,
- Celebration of major occasions (e.g. Environment day), Rashtriya Swachhta Diwas,
- Conducting Street plays,
- Mass cleaning- 'Clean up drive,

- School Programmes
  - Formation of 'eco clubs' in schools, organization of competitions
  - Involvement of NCC, NSS, Scouts Involvement of cine artists, political and religious leaders
- Presenting Awards through Competitions (e.g. Best performing Ward level Swachhata Protsahan Samiti, Eco house, Clean house)
- Incentives to households, commercial establishments
- Mass communication methods
  - Print media (advertisements at regular intervals)
  - Television, Cable TV, Radio and Websites
  - Cinema theatres (display of slides)
- Sensitization Workshop of Community Volunteers for Behaviour Change Communication (BCC) on SWM.
- Interpersonal Communication (IPC), contacting every household through Community Volunteers and supporting organizations Volunteers. These volunteers shall tale the message to each and every household and take their feedback as well. Convergence theory for the message dissemination and BCC by involving religious leaders, SHGs, Youth Clubs, Mahila Mandals, RWA and with pre-recorded religious & Cultural programme.
- Involvement of RWAs, CBOs, NGOs/SHGs and Market Associations is imperative to ensure the success of segregation at source. Regular meetings between the Gram Panchayat and Block staff and representatives of RWAs, Market associations, NGOs/SHGs and other stakeholders would be conducted so that the community becomes used to this practice.
- Involvement of Gram Swachhata Protsahan Committee comprising of Volunteers or Natural Leaders in each ward who will act as SBM ambassadors and take oath for Waste free Uttar Pradesh and each committee shall have minimum 10 members.

IEC activities shall be taken up, with the involvement of leading NGOs/advertising agencies. Materials required for the IEC campaign like manuals, flipcharts and other media communication could be designed by these agencies.



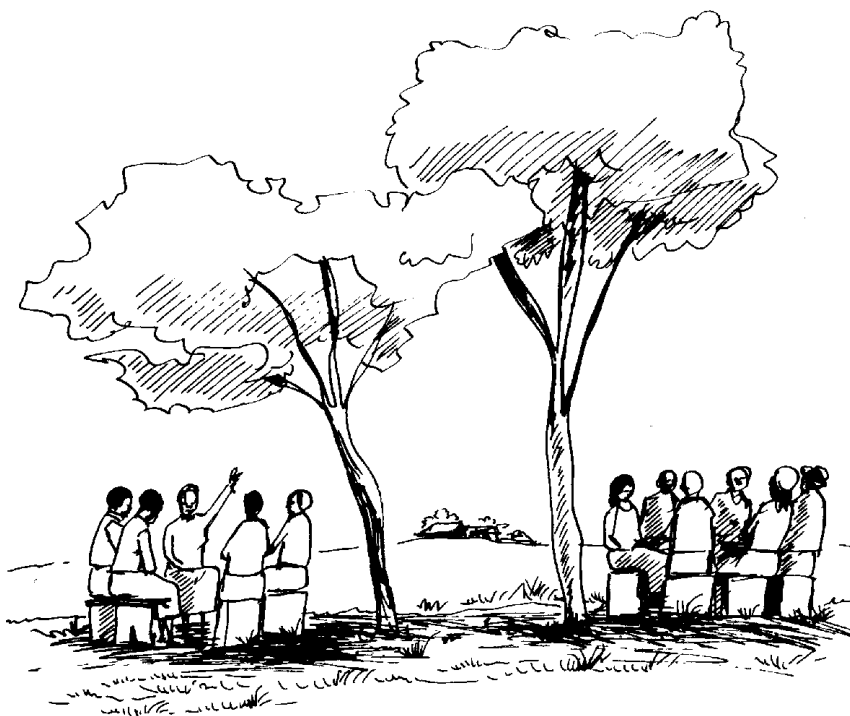
## PROVISION OF SAFETY EQUIPMENT

The MSW project shall also include provision of necessary tools and tackles, adequate protective clothing and safety gears to sanitary workers. Further, Gram Panchayats should provide adequate protection and health care facilities to its sanitation workers.



## INVOLVEMENT OF NGOS, SELF HELP GROUPS AND COMMUNITY PARTICIPATION

Solid Waste management suffers from lack of adequate community involvement. Existing laws provide for punitive action against house / building owner in case of letting out waste



impacting local environment.

The provisions are there for fines for violations like littering etc. The National Green Tribunals and Hon'ble Courts have also laid down the principles of charging environmental compensation in case of violations and environmental damages.

However, punitive action so far has not proven a major deterrent. The reasons are laxity in enforcement and very small amounts of fines.

Also, publicity of provisions

should be made in places frequented by public (eating places, shopping areas).

The successful implementation and management of solid waste is dependent to a large extent on strict enforcement of laws related to littering and SWM. The Gram Panchayats should revise the amount of fines in their bye-laws adequately to make it deterrent and ensure its implementation immediately

The Gram Panchayats should encourage the involvement of NGOS, Self Help Groups and Community Participation in the activity of Collection, segregation, transportation and processing of waste at MRF and Vermi- composting Units.

Some of the methods of ensuring community participation are given under:

- Door to door conversing
- Involving the community in planning and implementation activities of Solid Waste Management
- Effective IEC campaign

## **SUPPORT BY STATE GOVERNMENT: POLICY INSTRUMENTS**

1. The State Government shall extend support to those Gram Panchayats who take timely and effective measures to solve the problem of Solid Waste resulting in achieving the objectives of this policy. The State will make the releases of funds to Gram Panchayats under State Finance Commission, XIVth Finance Commission, and Infrastructure dependent on performance of Gram Panchayats in dealing with solid waste and their revenue generation / collection:

The support/Incentive could be in the following forms:

- (i) Incentive for waste reduction.
  - (ii) Making the wards and Gram Panchayat ODF and sustaining ODF status.
  - (iii) Incentive for making rules on Door to Door collection, Segregation, Prohibition of Littering, and introduction of User Charges.
  - (iv) Incentive for 100% collection of user charges.
  - (v) Incentive for achieving “0 waste” producing Gram Panchayats.
  - (vi) Incentive to Gram Panchayat for formalizing the informal sector like Kabadiwala, rag pickers & SHGs etc. into SWM activities.
2. Promotion of Private participation and investment in Solid Waste Management (collection, segregation, transportation, processing and disposal).
- (a) In cases where door to door collection of waste is involved and the applicant organization is not charging any fund from the Gram Panchayat/Block/District/State.

In cases where the applicant organization is willing to undertake the door to door collection of solid waste and negotiate the user charge with the house or establishment owner without charging any fund from the Gram Panchayat/Block/District or the State, the ward or a number of wards or entire Gram Panchayat can be assigned to the applicant for a period of maximum three years. This can be further renewed with mutual agreement of the parties for another three years. The Committee constituted at State level as in Para 2 (a) above will take final decision in the matter. For taking a decision at Gram Panchayat level a Committee will be constituted for the purpose. The Gram Panchayats will make available land in parks, landfills or any other suitable site for composting, segregation, and processing of collected waste on lease rental of Rs. 1 per square meter for a period of three years. The Gram Panchayat may have more than one agency in its area for working on Solid Waste Management.



### Characterization & Quantification of waste

The Centre conducted a survey for characterization and quantification of Solid Waste in Gram Panchayats of Uttar Pradesh. The category of waste is depicted in the table given below:

Sr. No.	Waste Type	Sub-Category & Type
5.	Bio-degradable Waste	Mostly green waste from the kitchen and animal waste
6.	Recyclable Waste	Plastic, Wood, Thermocol, Glass, Tin, Metal etc.
7.	Hazardous Waste	Diapers, Sanitary Napkins, Small batteries, unused medicines, syringes etc.
8.	Inert Waste	Mostly Mud and Dust

For the above purpose 4 districts had been selected from each region i.e. north, east, central and west.

- Gorakhpur
- Saharanpur
- Lucknow
- Jhansi

In the above districts 4 Gram Panchayats of each district were surveyed. From the selected Gram Panchayat, the sample was as under:

5. Gram Panchayat with more than 10000 population 300 households were surveyed.
6. Gram Panchayat with 5000-10000 population 150 households were surveyed.
7. Gram Panchayat with 2000-5000 population 100 households were surveyed.
8. Gram Panchayat with less than 2000 population 50 households were surveyed.

The selection of Gram Panchayats was done in consultation with the District authorities.

In each of the Gram Panchayats 7 day data (Solid Waste) was collected from each household and analysed as given under-

**Table-1 District Wise Per Capita Waste Generation**

Districts →		Saharanpur- 600 Families	Gorakhpur- 600 families	Lucknow- 600 families	Jhansi- 600 families
S. No.	Category of Waste	in gms- per day per capita	in gms- per day per capita	in gms- per day per capita	in gms- per day per capita
1	Inert Waste	12.88	30.32	10.29	15.10
2	Bio degradable Waste	54.97	41.50	43.47	36.88
3	Hazardus Waste	6.20	0.23	0.34	2.30
4	Recyclable Waste	12.14	8.96	15.41	13.85
	<b>Total</b>	<b>86.18</b>	<b>81.01</b>	<b>69.52</b>	<b>68.12</b>

It is clear from the above table-1 that per capita per day waste generation ranges from 86.18gms at Saharanpur to 68.12gms at Jhansi. It was found during the survey that bio-degradable waste at Saharanpur was more than other districts which has resulted in this variation. It is also seen from the above table that individual category of waste i.e. inert, bio-degradable, recyclable, we find that at Gorakhpur inert waste was more at 30.32gms per day whereas at Lucknow it was only 10.29gms per day. Similarly recyclable waste at Lucknow was 15.41gms per day and whereas at Gorakhpur it was only 8.96gms per day. We must also keep in mind that during the days of survey weather also played its role. For example at Gorakhpur increase in inert waste was probably due to heavy rains and people going into their house with mud stuck on their footwear.

**Table-2 Category Wise Recyclable Waste**

S. No.	Recyclable waste pr day in gms	Saharanpur-600 Families	Gorakhpur-600 families	Lucknow-600 families	Jhansi- 600 families
		per capita per day	per capita per day	per capita per day	per capita per day
1.	<b>Card Board</b>	0.79	0.08	0.57	2.02
2.	<b>Metal</b>	0.89	1.08	0.13	0.98
3.	<b>Thermocol</b>	0.83	0.11	0.16	1.60
4.	<b>Paper</b>	1.15	4.07	3.16	2.35
5.	<b>Plastic</b>	1.35	3.44	3.98	2.16
6.	<b>Wood</b>	1.21	0.07	1.89	3.28
7.	<b>Glass</b>	1.02	1.37	0.68	1.66
8.	<b>Others</b>	2.00	2.14	2.69	4.83

The table-2 gives analysis of categories of recyclable waste produced per capita per day. It was found that at Jhansi cardboard was 2.02gms per day per capita in comparison to .08gms at Gorakhpur. Similarly metal was highest at Gorakhpur with 1.08gms per capita per

day and at Lucknow it was only 0.13gms per capita per day. Thermocol was maximum at Jhansi 1.60gms per capita per day and lowest at Gorakhpur 0.11gms per capita per day. Paper was maximum at Gorakhpur at 4.07gms per capita per day and at Saharanpur it was only 1.15gms per capita per day. At Lucknow it was found that plastic waste was 3.44gms per capita per day and at Saharanpur it was only 1.35gms per capita per day. Glass was maximum at Jhansi with 1.66gms per capita per day and least at Lucknow 0.68gms per capita per day.

In the below tables we have tried to analyse the data with population size of Gram Panchayats i.e. Gram Panchayats with less than 2000 population, Gram Panchayats with 2000-5000 population, Gram Panchayat with 5000-10000 population and Gram Panchayat with more than 10000 population.

**Table-3 Category Wise Per Capita Waste Generation For Gram Panchayats Less Than 2000 Population**

<b>Districts →</b>		<b>Saharanpur- 50</b>	<b>Gorakhpur- 50</b>	<b>Lucknow- 50</b>	<b>Jhansi- 50</b>	<b>Average for U.P. Gram Panchayats less than 2000 population</b>
<b>Blocks &amp; Gram Panchayats with less than 2000 population</b>		<b>Block- Muzaffrabad, Gram- Anwarpur Barauli</b>	<b>Block- Khorabar, Gram- Chhitouna</b>	<b>Block- Bakshi ka Talab, Gram-Digoi</b>	<b>Block- Bamaur, Gram- Benda</b>	
<b>S. No.</b>	<b>Category of Waste</b>	<b>per capita</b>	<b>per capita</b>	<b>per capita</b>	<b>per capita</b>	<b>per capita</b>
1.	<b>Inert Waste</b>	8.13	23.08	0.68	10.63	<b>10.63</b>
2.	<b>Bio degradable Waste</b>	46.96	27.37	52.80	25.05	<b>38.05</b>
3.	<b>Hazardous Waste</b>	9.83	0.00	0.00	1.08	<b>2.73</b>
4.	<b>Recyclable Waste</b>	15.69	4.83	12.90	4.82	<b>9.56</b>
	<b>Total</b>	<b>80.62</b>	<b>55.28</b>	<b>66.38</b>	<b>41.59</b>	<b>60.97</b>
	<b>Total Family Members</b>	<b>281</b>	<b>320</b>	<b>337</b>	<b>329</b>	

In Table-3 above data for Gram Panchayats with less than 2000 population we can see that inert waste ranges from 23.08gms per day per capita at Gorakhpur to 0.68gms per day per capita at Lucknow whereas bio-degradable waste range from 52.80gms per day per capita at Lucknow to 25.05gms per day per capita at Jhansi and recyclable waste range between from 15.69gms at Saharanpur and 4.82gms per day per capita at Jhansi. Whereas hazardous waste ranges between 9.83gms per day per capita at Saharanpur and 0gms at Gorakhpur and Lucknow. From the above data we can predict average waste generation from U.P. Gram Panchayats less than 2000 population as total waste 60.97gms per day per capita out of which inert waste 10.63gms per day per capita, bio-degradable waste 38.05gms per day per capita, recyclable waste 9.56gms per day per capita and Hazardous waste 2.73gms per day per capita.

**Table-4 Category Wise Per Capita Waste Generation For Gram Panchayats Population 2000-5000**

Districts →		Saharanpur-100	Gorakhpur-100	Lucknow-100	Jhansi-100	Average for U.P. Gram Panchayats 2000-5000 population
Blocks & Gram Panchayats Gram Panchayats with 2000-5000 population		Block-Muzaffrabad, Gram-Anwarpur Barauli	Block-Muzaffrabad, Gram-Sansarpur	Block-Sahjanwa, Gram-Budhat	Block-Chinhhat, Gram-Papnama	
S. No.	Category of Waste	per capita	per capita	per capita	per capita	per capita
1.	<b>Inert Waste</b>	10.35	42.90	7.21	13.06	<b>18.38</b>
2.	<b>Bio degradable Waste</b>	47.81	76.68	45.54	35.11	<b>51.29</b>
3.	<b>Hazardous Waste</b>	7.05	0.02	0.37	3.42	<b>2.72</b>
4.	<b>Recyclable Waste</b>	13.70	5.96	23.74	12.21	<b>13.90</b>
	<b>Total</b>	<b>78.92</b>	<b>125.56</b>	<b>76.86</b>	<b>63.80</b>	<b>86.29</b>
	<b>Total Family Members</b>	<b>656</b>	<b>746</b>	<b>883</b>	<b>655</b>	

In Table-4 above data for Gram Panchayats with population 2000-5000 we can see that inert waste ranges from 42.90gms per day per capita at Gorakhpur to 7.21gms per day per capita at Lucknow whereas bio-degradable waste range from 76.68gms per day per capita at Gorakhpur to 35.11gms per day per capita at Jhansi and recyclable waste range between 23.74gms at Lucknow and 5.96gms per day per capita at Gorakhpur and hazardous waste ranges from 7.05gms per capita per day at Saharanpur to 0.02gms per day per capita at Gorakhpur. From the above data we can predict average waste generation from U.P. Gram Panchayats with population 2000-5000 as total waste 86.29gms per day per capita out of which inert waste 18.38gms per day per capita, bio-degradable waste 51.29gms per day per capita, hazardous waste is 2.72gms per day per capita and recyclable waste 13.90gms per day per capita.

**Table-5 Category Wise Per Capita Waste Generation For Gram Panchayats Population 5000-10000**

Districts $\Rightarrow$		Saharanpur-150	Gorakhpur-150	Lucknow-150	Jhansi-150	Average for U.P. Gram Panchayats 5000-10000 population
Blocks & Gram Panchayats with 5000-10000 population		Block-Muzaffrabad, Gram-Anwarpur Barauli	Block-Puwarka, Gram-Ugahu	Block-Piprauli, Gram-Piprauli	Block-Chinhath, Gram-Papnamau	
S. No.	Category of Waste	per capita	per capita	per capita	per capita	per capita
1.	Inert Waste	15.94	23.08	21.71	24.97	<b>21.43</b>
2.	Bio degradable Waste	43.45	28.08	52.77	38.10	<b>40.60</b>
3.	Hazardous Waste	6.12	0.01	0.06	2.54	<b>2.18</b>
4.	Recyclable Waste	14.96	5.47	19.76	8.92	<b>12.28</b>
	<b>Total</b>	<b>80.47</b>	<b>56.64</b>	<b>94.30</b>	<b>74.53</b>	<b>76.49</b>
	<b>Total Family Members</b>	<b>960</b>	<b>1069</b>	<b>918</b>	<b>897</b>	

In Table-5 above data for Gram Panchayats with population 5000-10000 we can see that inert waste ranges from 24.97gms per day per capita at Jhansi to 15.94gms per day per capita at Saharanpur whereas bio-degradable waste range from 52.77gms per day per capita at Lucknow to 28.08gms per day per capita at Gorakhpur and recyclable waste range between from 19.76gms at Lucknow and 5.47gms per day per capita at Gorakhpur and hazardous waste ranges between 6.12gms per day per capita at Saharanpur and 0.01gms per day per capita at Gorakhpur. From the above data we can predict average waste generation from U.P. Gram Panchayats with population 5000-10000 as total waste 76.49gms per day per capita out of which inert waste 21.43gms per day per capita, bio-degradable waste 40.60gms per day per capita, hazardous waste 2.18gms per day per capita and recyclable waste 12.28gms per day per capita.

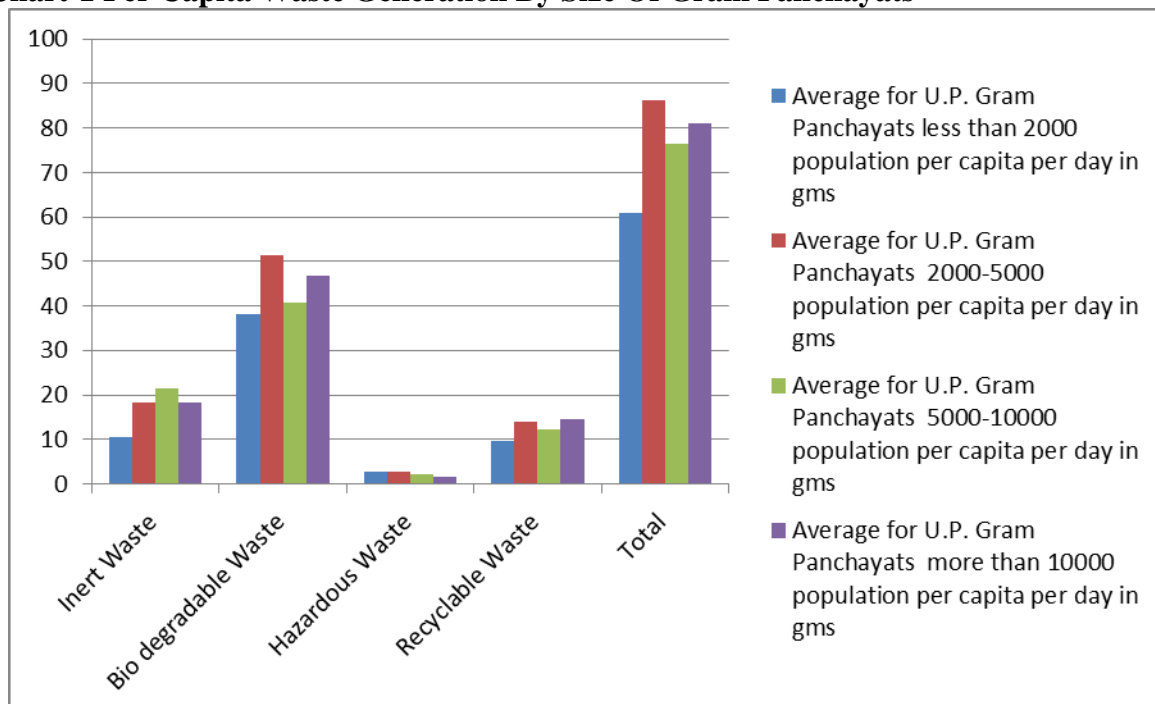
**Table-6 Category Wise Per Capita Waste Generation For Gram Panchayats More than 10000 Population**

Districts →		Saharanpur-300	Gorakhpur-300	Lucknow-300	Jhansi-300	Average for U.P. Gram Panchayats more than 10000 population
Blocks & Gram Panchayats with more than 10000 population		Block-Muzaffrabad, Gram-Anwarpur Barauli	Block-Puwarka, Gram-Kailashpur	Block-Piprauli, Gram-Jangal Suhas Rani Kuwari	Block-Chinhat, Gram-Juggaur	
S. No.	Category of Waste	per capita	per capita	per capita	per capita	per capita
1.	Inert Waste	17.09	32.22	11.57	11.73	<b>18.15</b>
2.	Bio degradable Waste	81.64	33.88	22.79	49.27	<b>46.90</b>
3.	Hazardous Waste	1.79	0.89	0.95	2.14	<b>1.44</b>
4.	Recyclable Waste	4.19	19.58	5.24	29.44	<b>14.61</b>
	<b>Total</b>	<b>104.71</b>	<b>86.57</b>	<b>40.55</b>	<b>92.58</b>	<b>81.10</b>
	<b>Total Family Members</b>	<b>1936</b>	<b>2008</b>	<b>1887</b>	<b>1700</b>	

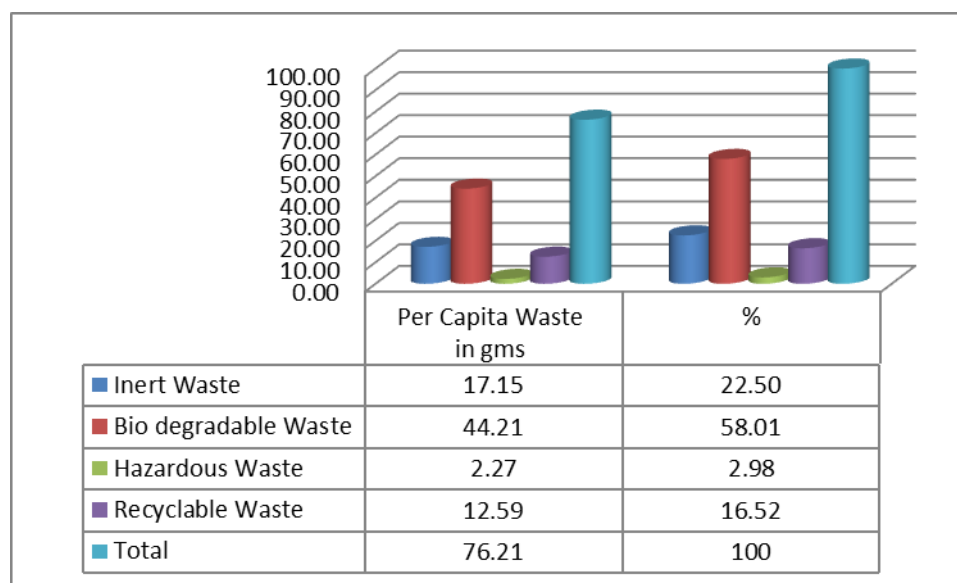
In Table-6 above data for Gram Panchayats with population more than 10000 we can see that inert waste ranges from 32.22gms per day per capita at Gorakhpur to 11.57gms per day per capita at Lucknow whereas bio-degradable waste range from 81.64gms per day per capita at Saharanpur to 22.79gms per day per capita at Lucknow and recyclable waste range between from 29.44gms at Jhansi and 4.19gms per day per capita at Saharanpur, whereas hazardous waste ranges between 2.14gms per day per capita at Jhansi and 0.89gms per day per capita at Gorakhpur. From the above data we can predict average waste generation from U.P. Gram Panchayats with population more than 10000 as total waste 81.10gms per day per capita out of which inert waste 18.15gms per day per capita, bio-degradable waste 46.90gms per day per capita and recyclable waste 14.61gms per day per capita and hazardous waste is 1.44gms per day per capita.

The above analyses for all the four sizes of Gram Panchayats is also given in Chart-1 in form of bar chart.

**Chart-1 Per Capita Waste Generation By Size Of Gram Panchayats**



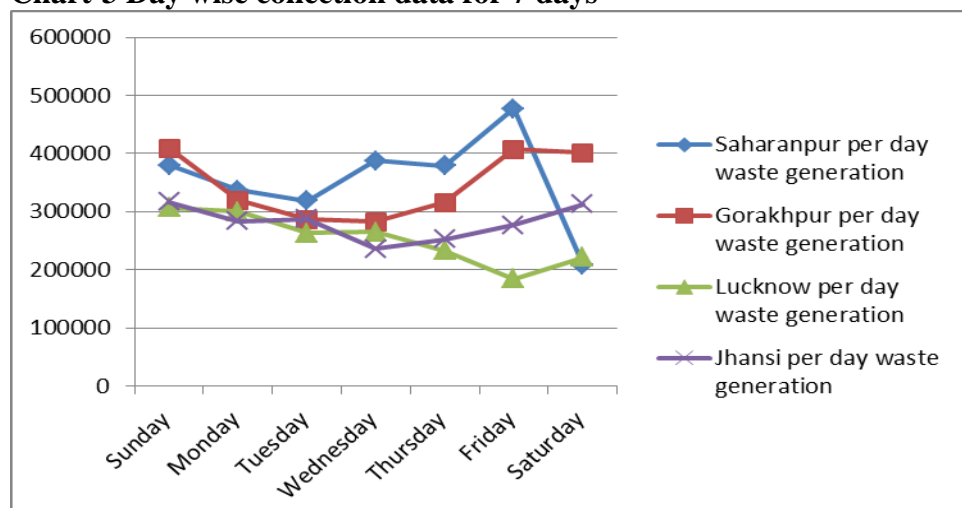
**Chart-2 Category wise waste generation per capita per day**



The above given Chart-2 gives the average waste generation category wise for gram panchayats of Uttar Pradesh as per capita waste generation per day 76.21gms. Inert waste 17.15gms per day per capita, bio-degradable waste 44.21gms per day per cpaita, recyclable waste 12.59gms per day per capita and hazardous waste is 2.27gms per day per capita.



**Chart-3 Day wise collection data for 7 days**



From the above Chart-3 it is found that the waste generated on Sundays and Mondays and weekly market days is more than other days of the week.

In order to get the data of waste generated and its type at the weekly markets, survey of one weekly market was done at each District. At **Saharanpur- Sansarpur** was taken, at **Gorakhpur -Piprauli Bujurg** was taken, at **Lucknow –Juggaur** was taken as at all the selected gram panchayats there was no weekly markets, whereas at Juggaur there was a market on all days, hence it was surveyed, and at **Jhansi -Chirgaon Dehat** was take-up.

**Table -7: Weekly Market Data- Number & Type of Shops/Stalls**

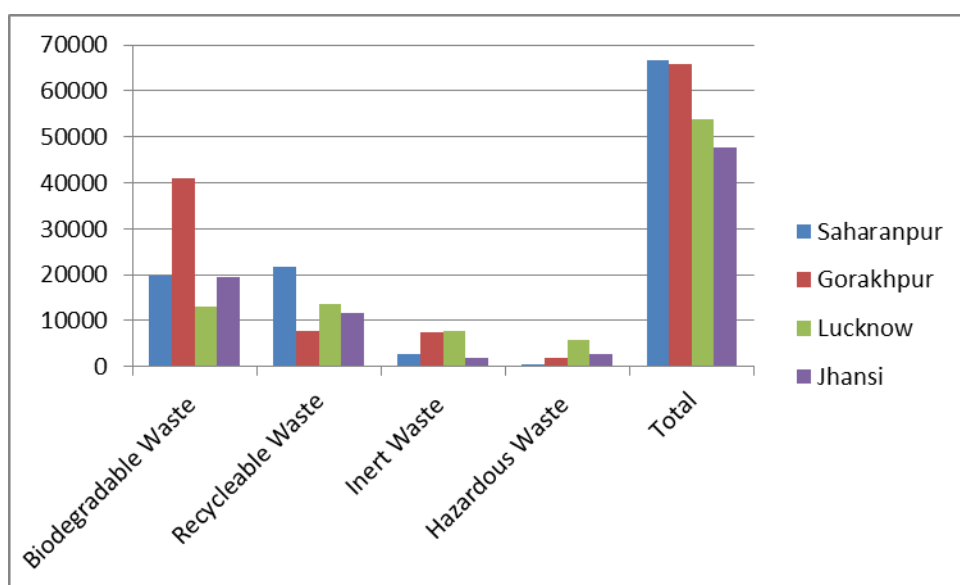
		<b>Sansarpur- Saharanpur</b>	<b>Piprauli Bujurg- Gorakhpur</b>	<b>Juggaur- Lucknow</b>	<b>Chirgaon Dehat- Jhansi</b>
S. No.	<b>Nature or Type/category of Stall</b>	<b>Total No. of Stall</b>	<b>Total No. of Stall</b>	<b>Total No. of Stall</b>	<b>Total No. of Stall</b>
1	Vegetables, Flowers and Fruits	52	95	8	23
2	Meat/Chikan/Fish Stalls	3	6	1	4
3	Food Stalls	4	21	5	5
4	Grains Stalls	12	14	2	3
5	Handlooms & clothes	13	11	4	3
6	Kitchen Utility Stalls	3	18	1	5
7	Farm Utility Stalls	6	0	4	1
8	Footwear Stall	9	5	1	7
9	Plastic Households/Plastic wares	1	8	2	5
10	Decorative items stalls	2	8	0	1
11	Cosmetics Stalls	3	6	4	2
12	Others-clay pot etc	4	8	6	8
	<b>Total</b>	<b>112</b>	<b>200</b>	<b>38</b>	<b>67</b>

**Table -8: Weekly Market Data- Categorization of Waste. (In Gms)**

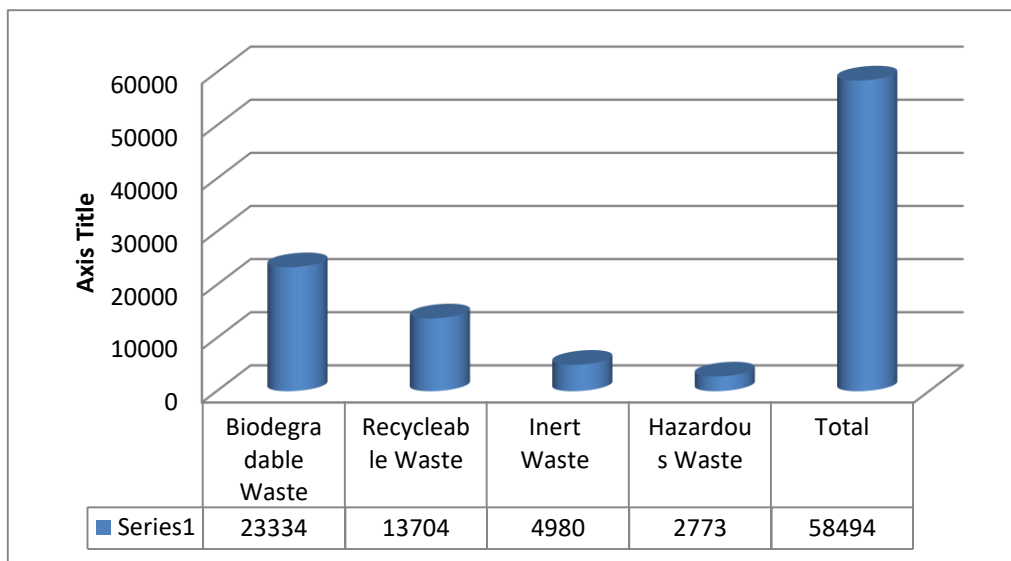
	Saharanpur	Gorakhpur	Lucknow	Jhansi
<b>Biodegradable Waste</b>	<b>19768</b>	<b>41000</b>	<b>13200</b>	<b>19368</b>
<b>Recycleable Waste</b>	<b>21836</b>	<b>7730</b>	<b>13500</b>	<b>11749</b>
• Paper	8684	3700	4893	2716
• Plastic	7419	1600	3664	5620
• Metal	135	145		0
• Glass	385	235	2640	366
• Thermocol	0	750	498	438
• Cardboard	0	1300	0	0
• Wood	0	0	0	0
• Others	5213	0	1805	2609
<b>Inert Waste</b>	<b>2639</b>	<b>7600</b>	<b>7850</b>	<b>1830</b>
<b>Hazardous Waste</b>	<b>576</b>	<b>1800</b>	<b>5843</b>	<b>2871</b>

From the above table and Chart below we find Biodegradable Waste maximum followed by Recycleable and within that Plastic & Paper Waste. Some Hazardous Waste is also generated.

**Chart -4: Weekly Market Data- Categorization of Waste. (In Gms)**



**Chart – 5 Average Waste Generation For U.P.**



After detailed analysis of sample data collected the following result can be inferred. In U.P. from weekly markets per day category wise waste generation would be about, 23.3 kg biodegradable, 13.7 kg recyclable, 5 kg inert and 2.7 kg hazardous waste.

## ANNEXURE-2

### **Standard Operating Procedure for Making “Pellets From Plastic Waste”**

Embedded in the heart of India, a land where cultures have evolved and religions emerge. The greatness of Uttar Pradesh lies not only in this confluence, but also in the emergence of cultural and religious traditions along some of the greatest rivers in the Indian sub-continent – the Ganga and the Yamuna. Throughout history, great cities have emerged and established along great rivers. Within India, the Ganga and the Yamuna have nurtured a culture because of which religious faith, rituals, culture and intellectual enlightenment have evolved in places along the two rivers.

Uttar Pradesh is the 4<sup>th</sup> 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. Administratively Uttar Pradesh is divided into 75 districts under 18 divisions which are They are Agra, Aligarh, Azamgarh, Allahabad, Kanpur, Gorakhpur, Chitrakoot Dham, Jhansi, Devi Patan, Faizabad, Bareilly, Basti, Vindhyachal (Mirzapur), Moradabad, Meerut, Lucknow, Varanasi and Saharanpur.


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.

### **Introduction to Solid Waste Management**

Solid waste management is the collecting, treating, and disposing of solid material that is discarded. It also offers solutions for recycling items that do not belong to garbage or trash. With this increasing population, solid waste management in the country has emerged as a challenge not only because of the environmental and aesthetic concerns, but also because of the huge quantities of waste generated every day.

Waste management is all about how solid waste can be changed and used as a valuable resource i.e. waste to wealth. It is the process of treating solid wastes and offers variety of solutions for recycling items that don't belong to trash. It is about how garbage can be used as a valuable resource. Solid waste management should be embraced by each and every household including the business owners across the world. One of the negative effects of industrialization is the creation of solid waste.

According to Britannica, “Solid-waste management, the collecting, treating, and disposing of solid material that is discarded because it has served its purpose or is no longer useful. Improper disposal of solid waste can create unsanitary conditions, and these conditions in turn can lead to pollution of the environment and to outbreaks of vector-borne disease—that is, diseases spread by rodents and insects.”



The Environment Ministry Solid Waste Management Rules 2000 have been revised after 16 years. The Rules are now applicable beyond municipal areas and will extend to urban agglomerations, census towns, notified industrial townships, areas under the control of Indian Railways, airports, airbase, port and harbour, defence establishments, special economic zones, State and Central government organizations, places of pilgrims, religious & historical importance.

The responsibility of generators has been introduced to segregate waste into three categories – Wet, Dry and Hazardous Waste. Now the generator will have to pay ‘User Fee’ to the waste collector and a ‘Spot Fine’ for littering and non-segregation, the quantum of which will be decided by the local bodies. The government is keen on the integration of ragpickers from the informal sector to the formal sector.

The Government has also constituted a Central Monitoring Committee under the chairmanship of Secretary, Ministry of Environment, Forest and Climate Change to monitor the overall implementation of the Rules. The Committee comprises the Ministry of Urban Development, Ministry of Rural Development, Ministry of Chemicals and Fertilizers, Ministry of Agriculture, Central Pollution Control Board, three State Pollution Control Boards /Pollution Control Committees, Urban Development Departments of three State Governments, rural development departments from two State Governments, three urban local bodies, two census towns, Federation of Indian Chambers of Commerce & Industry (FICCI), Confederation of Indian Industry (CII) and two subject experts. The Committee will meet once a year to monitor the implementation of these Rules.

Plastics are non-biodegradable and remain on earth for thousands of years. The burning of plastics waste under uncontrolled conditions lead to generation of different hazardous air pollutants (HAPs), depending upon the type of polymers and additives used. However, the end-of-life plastics can be recycled into a second life application but after every thermal treatment/recycling deterioration in quality of recycled plastic products. Thus plastic waste can be recycled only 3-4 times. The visibility of huge quantity of plastic waste has been perceived as a serious problem and made plastics a target in the management of solid waste.

## **Recycling of Plastic Waste**

Recycling and re-utilization of waste plastics have several advantages. It leads to a reduction of the use of virgin materials and of the use of energy, thus also a reduction of carbon dioxide emissions.

### **Benefits of Recycling:**

- Reduces Environmental Pollution
- Energy savings : 40 - 100 MJ/kg (depends on the polymer)
- Economic Benefits • Reduces demand for virgin polymer
- Preferred to Land Filling
- Generates Employment
- Reduces depletion of Fossil fuel reserves

### **Difficulties in Recycling:**

- Hard to separate from non-plastics (no 'magnet' equivalent)
- Differing composition of plastic resins means they are largely incompatible
- Degradation of polymer chains on recycling
- Recycled polymer is of lower quality than virgin polymer
- Most waste plastics films specially thin plastics films have limited market value, therefore effort is not spent in collecting them
- Identification of reuse and recycling opportunities
- Markets for Plastics; Lack of Infrastructure
- Low value of recovered Plastics
- Subsidies for recycling program

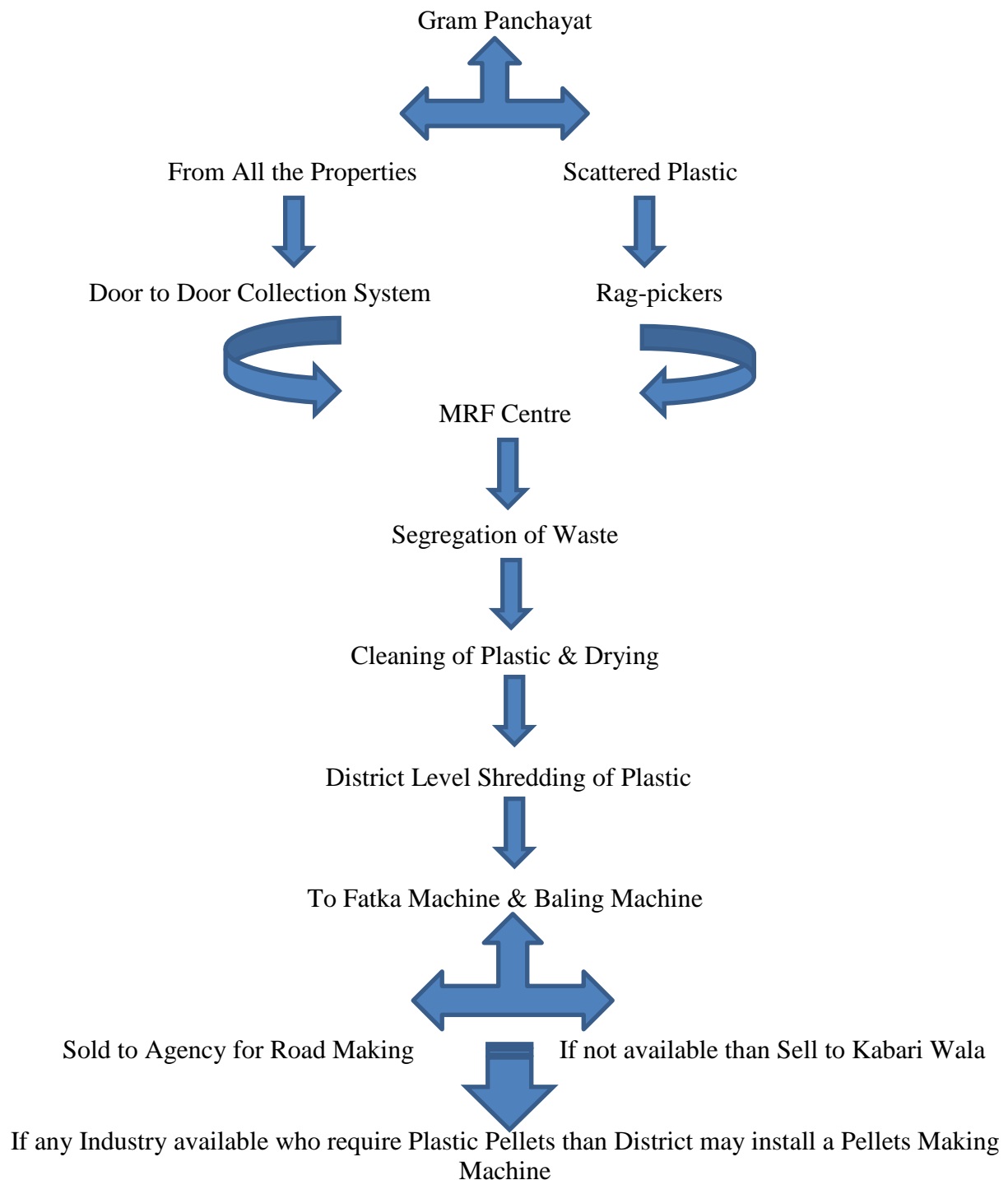
**As per the provisions of the “Solid Waste Management Rules, 2016” every Gram Panchayats is made responsible through point no. 15 (h) , which reads as:**

15. Duties and responsibilities of local authorities and village Panchayats of census towns and urban agglomerations.- The local authorities and Panchayats shall,-

(h) setup material recovery facilities or secondary storage facilities with sufficient space for sorting of recyclable materials to enable informal or authorised waste pickers and waste collectors to separate recyclables from the waste and provide easy access to waste pickers and recyclers for collection of segregated recyclable waste such as paper, plastic, metal, glass, textile from the source of generation or from material recovery facilities; Bins for storage of bio-degradable wastes shall be painted green, those for storage of recyclable wastes shall be printed white and those for storage of other wastes shall be printed black;

The Gram Panchayat is required to collect all the Plastic waste collected at the MRF Centres and by Rag-pickers, and send it to the unit to make Pallets at the District, so that it could be sold to the PWD Deptt or the Road Construction Contractors in Road Making. The rate should be arrived after taking into account the following costs.

- Cost which Gram Panchayat would have got if it had sold the plastic waste.
- Cost to District in Pallet making; Humane Resource Cost, Running of Plant Cost (Electricity etc), Capital cost which should be recoverable in five years.



What is Plastic Pellets Making Machine:

The plastic pellets making machine is a device that used to recycle and process waste plastics and make recycled plastic pellets. It is suitable for recycling common waste plastic products such as polyethylene (plastic film, beverage bottles, plastic bags, etc.) or polypropylene (waste woven bags, packing bags, tied ropes, etc.). Recycled plastic pellets



can be produced through major steps such as extrusion, cooling, and pelletizing. The processed plastic pellets have a wide range of uses and can produce higher benefits.

Process:

1. Clean the materials – Through Fatka Machine

Since the raw material comes from discarded plastic products, it is inevitable that there will be residual pollutants, so the raw material needs to be cleaned before making recycled plastic pellets.



2. Crushing raw materials – Shredding Machine

Clean plastic raw materials need to be crushed by crusher to meet the processing standard of plastic pellets making machine.



3. Plastic pellet mill granulation – Pellet Machine

The waste plastic is crushed by a crusher and sent to the feeder by an automatic hoist and then feeder feeds the material into the plastic pellets making machine. After entering the plastic pellet mill, the material is mixed and re-plasticized under the action of compression and external heating of the screw. With the increasing of temperature and pressure, it presents a viscous flow state and is pushed to the head part by certain pressure. Finally, the plasticizer is cut into pellets by a cutter.



#### 4. Plastic pellets cooling and packaging

As the temperature of the formed recycled plastic pellets by the plastic pellets making machine is still very high, it needs to be cooled through the cooling system. After cooling to normal temperature, it can be packaged with the packaging machine.



### Plastic to Road Construction

The implementation of plastics in roads opens a new option for recycling post-consumer plastics. Plastic roads are made entirely of plastic or of composites of plastic with other materials.

The types of plastic that can be used for construction of roads are Polystyrene (PS) (Hard packaging, cartons, plates, vending cups etc.); Polypropylene (PP) (ketchup bottles, yogurt cups etc.); Polyethylene (PE) (both high and low density) (plastic bags, water bottle, shampoo bottle etc.). Please note that Poly Vinyl Chloride (PVC) sheets or Flux sheets should not be used.


Waste plastic is shredded into required size and mixed with hot stone (150 to 170 °C) with uniform mixing. When heated to around 150 to 170 °C, plastic melts and spreads over the stone aggregate in its molten state, giving a thin coating at the surface and acting as a binder. The points to note here are:

- Plastics cannot be melted separately to use for coating. On contact with the surface of the hot stone the plastic gel softens and coats over the aggregate. It is important to note that the size of the shredded plastic should be less than the surface area of the aggregate to get uniform coating, otherwise the binding will not be effective.
- The waste plastic when heated to temperature more than 250 °C may decompose producing gaseous products which results in air pollution, hence the temperature during heating shall be maintained between 150 to 170 °C. It is to be ensured that plastic is boiling and not burning.

### Other Option for Districts -

The Districts who produce more than 10MT of Plastic Waste per day may go in for Plastic to Fuel projects. The type of technology /project should be decided, based on the type of plastic available. Some of the processes are discussed below:

- **Depolymerisation:** The low-temperature catalytic depolymerization line is used for processing of waste plastics. This device works on the principle of depolymerization (pyrolysis) of the polymer to hydrocarbon products, which are pyrolysis oil, pyrolysis gas, and a solid residue - carbon. The process Depolymerization is degradation of bonds to break down into monomers. This process is utilized for the degradation of plastic to lower hydrocarbons. Chemical Depolymerisation has successfully been employed to recover monomers from PET, polyamides such as nylons and polyurethanes. It has the ability to return a recovered resin to virgin resin-like quality, and the potential to recover a valuable feedstock from products that are economically challenging to recycle. The Depolymerization is carried out in a specially designed Reactor, in absence of oxygen and in the presence of certain catalytic additives. The maximum reaction temperature is 350°C. The entire feed material is converted into either of the products: Liquid RDF, gases and solids. The solids can be reused as fuel in cement industries while the gas is reused in the system as a fuel. The unused hot Air from the reactor is released through chimney.
- **Plastic to Fuel (Pyrolytic Conversion Technologies):** A new generation of conversion technology, specifically designed to manage non-recyclable plastics, has been developed, and commercial scale facilities that use pyrolysis technology to convert plastics into oil and fuel are being established in Europe and Asia. Pyrolysis is the thermal decomposition of materials at elevated temperatures in an inert atmosphere. The benefits presented by plastic to fuel (PTF) technologies are two-fold: (1) Transforming non-recyclable plastics into a valuable commodity (2) Creating a reliable source of alternative energy from an abundant, no/low cost feedstock.
- **Plasma Pyrolysis Technology (PPT):** Plasma Pyrolysis is a state of the art technology, which integrates the thermo-chemical properties of plasma with the pyrolysis process. The intense and versatile heat generation capabilities of Plasma Pyrolysis technology enable it to dispose of all types of plastic waste including polymeric, biomedical and hazardous waste in a safe and reliable manner. Pyrolysis is the thermal disintegration of carbonaceous material in oxygen-starved atmosphere. In



Plasma Pyrolysis, firstly the plastics waste is fed into the primary chamber at 8500°C through a feeder. The waste material dissociates into carbon monoxide, hydrogen, methane, higher hydrocarbons etc. Induced draft fan drains the pyrolysis gases as well as plastics waste into the secondary chamber where these gases are combusted in the presence of excess air. The inflammable gases are ignited with high voltage spark. The secondary chamber temperature is maintained at 10500 °C. The hydrocarbon, CO and hydrogen are combusted into safe carbon dioxide and water. The process conditions are maintained such that it eliminates the possibility of formation of toxic dioxins and furans molecules (in case of chlorinated waste). The conversion of organic waste into non-toxic gases (CO<sub>2</sub>, H<sub>2</sub>O) is more than 99%. The extreme conditions of plasma kill stable bacteria such as bacillus stereothermophilus and bacillus subtilis immediately.

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## References

Plastic Waste Management Issues, Solutions and Case Studies, Ministry of Housing and Urban Affairs, Govt. of India-2019  
Solid Waste Management Rules 2016.  
Plastic Waste Management Rules 2016.  
Uttar Pradesh Policy on Solid Waste Management.

**Establishing of MRF Centres as per Requirement:**

A materials recovery facility is a specialized plant that receives, separates and prepares recyclable materials for marketing (**Processing of Recyclable Waste**) Gram Panchayat's to construct a MRF Centre which is a secondary segregation place. Its main Components are:

- No fixed shape and design
- Shade with walls and Gate
- Waste sorting platforms
- Washing area
- Drying area
- Storage area
- Light , fan and Exhaust
- Toilets
- Tap Water with storage and boring
- On arrival of material it has to be sanitized.

**1. Integration of Rag-pickers:**

{ Informal waste collector - includes individuals, associations or waste traders who are involved in sorting, sale and purchase of recyclable materials. }

For the integration of rag-pickers from the informal sector to the formal sector, the Gram Panchayats/ Blocks must take the following steps:

- Should conduct a quick survey to identify the Rag-pickers.
- Register them and give them a Photo ID card.
- Try to know the total monthly income of each Rag-picker.
- Now give them Safety equipment like : Boots, Gloves, Masks, Proper picking sticks and soap.
- Identify the main Kabari wala of your town and fix the rates for all the material which is collected by Rag-pickers.
- Every evening collect segregated waste after taking weight from Rag-pickers, and make a note of it in a register.
- Every week sell the collected waste to Kabari walla on agreed rates, except plastic waste.
- Now pay the Rag-pickers as per the weight of waste collected and sold to kabari walla at the rates received. For plastic waste Gram Panchayat to pay as per rate of Kabari walla.

In this way the rag-pickers will get more money, as middle men would be eliminated. And they would also get safe and better environment to work. The Gram Panchayat would benefit, as less amount of waste would be required to handle.

## **2. Suggestive time table to make the system functional.**

### **➤ Door to Door Collection of Waste**

- 1. At fixed time every day. Say 7a.m to 11am.**
- 2. Take the collected waste to MRF centre. 11am -12 noon.**

### **➤ MRF Centre**

- 1. Further segregation of waste by the collector and Rag pickers collected by them respectively. 1pm to 3pm**
  - 2. Bio-degradable waste to be sent to Vermi- composting Unit.**
  - 3. Washing of dirty plastic. 3pm to 3.30pm.**
  - 4. Other team to take over the process – to shredder and then To Fatka Machine & Baling Machine. ( Big Gram Panchayats)**
- 3. Further if required to Pellets Making Machine.**
  - 4. Establishing of Pallet making Unit by the District.**
  - 5. Mixed Inert and Hazordus Waste to be sent to the facility established by the District.**




## Definitions

Some important definitions which are mentioned in Solid Waste Management Rules, 2016 are as follows:


1. **Aerobic composting** - means a controlled process involving microbial decomposition of organic matter in the presence of oxygen;
2. **Anaerobic digestion** - means a controlled process involving microbial decomposition of organic matter in absence of oxygen;
3. **Authorisation** - means the permission given by the State Pollution Control Board or Pollution Control Committee, as the case may be, to the operator of a facility or urban local authority, or any other agency responsible for processing and disposal of solid waste;
4. **Biodegradable waste** - means any organic material that can be degraded by micro-organisms into simpler stable compounds;
5. **Bio-methanation** - means a process which entails enzymatic decomposition of the organic matter by microbial action to produce methane rich biogas;
6. **Brand owner** - means a person or company who sells any commodity under a registered brand label.
7. **Buffer zone**- means zone of no development to be maintained around solid waste processing and disposal facility, exceeding 5 TPD of installed capacity. This will be maintained within total area allotted for the solid waste processing and disposal facility.
8. **Bulk waste generator** - means and includes buildings occupied by the Central government departments or undertakings, State government departments or undertakings, local bodies, public sector undertakings or private companies, hospitals, nursing homes, schools, colleges, universities, other educational institutions, hostels, hotels, commercial establishments, markets, places of worship, stadia and sports complexes having an average waste generation rate exceeding 100kg per day.
9. **Bye-laws** - means regulatory framework notified by local body, census town and notified area townships for facilitating the implementation of these rules effectively in their jurisdiction.
10. **Census town** - means an urban area as defined by the Registrar General and Census Commissioner of India.
11. **Combustible Waste**- means non-biodegradable, non-recyclable, non-reusable, non hazardous solid waste having minimum calorific value exceeding 1500 kcal/kg and excluding chlorinated materials like plastic, wood pulp, etc.
12. **Composting** - means a controlled process involving microbial decomposition of organic matter.



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13. **Contractor** - means a person or firm that undertakes a contract to provide materials or labour to perform a service or do a job for service providing authority;
  14. **Co-processing** - means use of non-biodegradable and non-recyclable solid waste having calorific value exceeding 1500k/cal as raw material or as a source of energy or both to replace or supplement the natural mineral resources and fossil fuels in industrial processes.
  15. **Decentralised processing** - means establishment of dispersed facilities for maximizing the processing of biodegradable waste and recovery of recyclables closest to the source of generation so as to minimize transportation of waste for processing or disposal;
  16. **Disposal**- means the final and safe disposal of post processed residual solid waste and inert street sweepings and silt from surface drains on land as specified in Schedule I to prevent contamination of ground water, surface water, ambient air and attraction of animals or birds;
  17. **Domestic Hazardous Waste** - means discarded paint drums, pesticide cans, CFL bulbs, tube lights, expired medicines, broken mercury thermometers, used batteries, used needles and syringes and contaminated gauge, etc., generated at the household level;
  18. **Door to door collection** - means collection of solid waste from the door step of households, shops, commercial establishments , offices , institutional or any other non-residential premises and includes collection of such waste from entry gate or a designated location on the ground floor in a housing society , multi storied building or apartments , large residential, commercial or institutional complex or premises;.
  19. **Dry waste** - means waste other than bio-degradable waste and inert street sweepings and includes recyclable and non-recyclable waste, combustible waste and sanitary napkin and diapers, etc;
  20. **Dump sites** - means a land utilised by local body for disposal of solid waste without following the principles of sanitary land filling;
  21. **Extended Producer Responsibility (EPR)** - means responsibility of any producer of packaging products such as plastic, tin, glass and corrugated boxes, etc., for environmentally sound management, till end-of-life of the packaging products;
  22. **Facility** - means any establishment wherein the solid waste management processes namely segregation, recovery, storage, collection, recycling, processing, treatment or safe disposal are carried out;
  23. **Fine** - means penalty imposed on waste generators or operators of waste processing and disposal facilities under the bye-laws for non-compliance of the directions contained in these rules and/or bye- laws.
  24. **Form** - means a F8orm appended to these rules;
  25. **Handling** - includes all activities relating to sorting, segregation, material recovery, collection, secondary storage, shredding, baling, crushing, loading, unloading, transportation, processing and disposal of solid wastes.
  26. **Inert** - means wastes which are not bio-degradable, recyclable or combustible street sweeping or dust and silt removed from the surface drains;

27. **Incineration**- means an engineered process involving burning or combustion of solid waste to thermally degrade waste materials at high temperatures.
28. **Informalwastecollector** - includes individuals, associations or waste traders who are involved in sorting, sale and purchase of recyclable materials.
29. **Leachate** - means the liquid that seeps through solid waste or other medium and has extracts of dissolved or suspended material from it.
30. **Local body** - for the purpose of these rules means and includes the municipal corporation, Nagar Nigam, municipal council, Nagarpalika, Nagar PalikaParishad, Municipal board, Nagar Panchayatand town panchayat, census towns, notified areas and notified industrial townships with whatever name they are called in different States and union territories in India.
31. **Materials Recovery Facility (MRF)** - means a facility where non-compostable solid waste can be temporarily stored by the local body or any other entity mentioned in rule 2 or any person or agency authorised by any of them to facilitate segregation, sorting and recovery of recyclables from various components of waste by authorised informal sector of waste pickers, informal recyclers or any other work force engaged by the local body or entity mentioned in rule 2for the purpose before the waste is delivered or taken up for its processing or disposal.
32. **Non-biodegradable waste** - means any waste that cannot be degraded by microorganisms into simpler stable compounds;
33. **Operator of a facility** - means a person or entity, who owns or operates a facility for handling solid waste which includes the local body and any other entity or agency appointed by the local body.
34. **Primary collection** - means collecting, lifting and removal of segregated solid waste from source of its generation including households, shops, offices and any other non-residential premises or from any collection points or any other location specified by the local body.
35. **Processing** - means any scientific process by which segregated solid waste is handled for the purpose of reuse, recycling or transformation into new products.
36. **Recycling**- means the process of transforming segregated non-biodegradable solid waste into new material or product or as raw material for producing new products which may or may not be similar to the original products.
37. **Redevelopment** - means rebuilding of old residential or commercial buildings at the same site, where the existing buildings and other infrastructures have become dilapidated;
38. **Refused Derived Fuel (RDF)** - means fuel derived from combustible waste fraction of solid waste like plastic, wood, pulp or organic waste, other than chlorinated materials, in the form of pellets or fluff produced by drying, shredding, dehydrating and compacting of solid waste ;
39. **Residual solid waste** - means and includes the waste and rejects from the solid waste processing facilities which are not suitable for recycling or further processing;
40. **Sanitary land filling** - means the final and safe disposal of residual solid waste and inert wastes on land in a facility designed with protective measures against pollution of ground water, surface water and fugitive air dust, wind-blown litter, bad odour, fire

- hazard, animal menace, bird menace, pests or rodents, greenhouse gas emissions, persistent organic pollutants slope instability and erosion;
41. **Sanitary waste** - means wastes comprising of used diapers, sanitary towels or napkins, tampons, condoms, incontinence sheets and any other similar waste;
  42. **Schedule** - means the Schedule appended to these rules;
  43. **Secondary storage** - means the temporary containment of solid waste after collection at secondary waste storage depots or MRFs or bins for onward transportation of the waste to the processing or disposal facility.
  44. **Segregation** - means sorting and separate storage of various components of solid waste namely biodegradable wastes including agriculture and dairy waste, non-biodegradable wastes including recyclable waste, non-recyclable combustible waste, sanitary waste and non-recyclable inert waste, domestic hazardous wastes, and construction and demolition wastes;
  45. **Service provider** - means an authority providing public utility services like water, sewerage, electricity, telephone, roads, drainage, etc.
  46. **Solid waste** - means and includes solid or semi-solid domestic waste, sanitary waste, commercial waste, institutional waste, catering and market waste and other non-residential wastes, street sweepings, silt removed or collected from the surface drains, horticulture waste, agriculture and dairy waste, treated bio-medical waste excluding industrial waste, bio-medical waste and e-waste, battery waste, radio-active waste generated in the area under the local authorities and other entities mentioned in rule 2.
  47. **Sorting** - means separating various components and categories of recyclables such as paper, plastic, cardboards, metal, glass, etc., from mixed waste as may be appropriate to facilitate recycling.
  48. **Stabilising**- means the biological decomposition of biodegradable wastes to a stable state where it generates no leachate or offensive odours and is fit for application to farm land ,soil erosion control and soil remediation.
  49. **Street vendor** - means any person engaged in vending of articles, goods, wares, food items or merchandise of everyday use or offering services to the general public, in a street, lane, side walk, footpath, pavement, public park or any other public place or private area, from a temporary built up structure or by moving from place to place and includes hawker, peddler, squatter and all other synonymous terms which may be local or region specific; and the words “street vending” with their grammatical variations and cognate expressions, shall be construed accordingly.
  50. **Tipping fee** - means a fee or support price determined by the local authorities or any state agency authorised by the State government to be paid to the concessionaire or operator of waste processing facility or for disposal of residual solid waste at the landfill.
  51. **Transfer station** - means a facility created to receive solid waste from collection areas and transport in bulk in covered vehicles or containers to waste processing and, or, disposal facilities;
  52. **Transportation** - means conveyance of solid waste, either treated, partly treated or untreated from a location to another location in an environmentally soundmanner



through specially designed and covered transport system so as to prevent the foul odour, littering and unsightly conditions.

- 53. **Treatment** - means the method, technique or process designed to modify physical, chemical or biological characteristics or composition of any waste so as to reduce its volume and potential to cause harm.
- 54. **User fee** - means a fee imposed by the local body and any entity mentioned in rule 2 on the waste generator to cover full or part cost of providing solid waste collection, transportation, processing and disposal services.
- 55. **Vermin-composting** - means the process of conversion of bio-degradable waste into compost using earth worms.
- 56. **Waste generator** - means and includes every person or group of persons, every residential premises and non-residential establishments including Indian Railways, defence establishments, which generate solid waste.
- 57. **Waste hierarchy** - means the priority order in which the solid waste is to should be managed by giving emphasis to prevention, reduction, reuse, recycling, recovery and disposal, with prevention being the most preferred option and the disposal at the landfill being the least.
- 58. **Waste picker (Rag picker)** - means a person or groups of persons informally engaged in collection and recovery of reusable and recyclable solid waste from the source of waste generation the streets, bins, material recovery facilities, processing and waste disposal facilities for sale to recyclers directly or through intermediaries to earn their livelihood.

