

## Guideline Document for Setting Up Garbage Banks under the Unnat Bharat Abhiyan Program

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### Objective:

The goal is to establish a collection system and banks for reverse logistics of dry waste management in villages across India, termed 'Garbage Banks'. Participating institutes will venture into selected villages, identify waste management challenges, and submit proposals for setting up Garbage Banks. This document outlines the protocol for proposal submission and evaluation criteria for funding.

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### Protocol for Proposal Submission:

#### 1. Village Profiling:

- **Identify the Village Extent:**
  - Document the population, number of households, commercial establishments, industries, community halls, bus stops, temples, or any other waste-contributing locations.
- **Waste Quantification:**
  - Measure and document the total amount of waste collected in a month.
  - Categorize waste into recyclables and non-recyclables and calculate the percentage of each.

#### 2. Existing Waste Collection System:

- **Collection Analysis:**
  - Investigate if the village has a house-to-house collection system in place.
  - Analyze the percentage of waste segregation happening at the source (households, commercial entities, etc.).
- **Panchayat Involvement:**
  - Evaluate whether panchayat sanitation workers are segregating waste at any stage.
  - Describe the current waste management system implemented by the panchayat - if it has composting and other dry waste management in place

#### 3. Infrastructure Assessment:

- **Existing Facilities:**
  - Create a checklist to document the presence and status of the following facilities:

- Composting yard
- Conveyor system
- Baling machine
- Shredding machine
- Shed for storing dry waste

4. **Recyclables Quantification:**

- **Polyethylene** (Chips packets, Shampoo sachets, Washing liquid bottles, Plastic carry bags, Milk pouches, Detergent packets) .....**kg**
- **Polypropylene** (Food containers, Straws, Bottle caps, Rope, Plastic chairs and tables, Reusable plastic containers) .....**kg**
- **Polyethylene Terephthalate** (Water bottles, Soft drink bottles, Cooking oil bottles, Transparent food packaging
- **High-Density Polyethylene** (Shampoo bottles, Motor oil bottles, Detergent containers, Large plastic drums, Agricultural pesticide containers) .....**kg**
- **Low-Density Polyethylene** (Plastic bags, Squeezable bottles (e.g., for honey,)), Frozen food bags, Bread bags, Plastic wrap etc.,) .....**kg**
- **Polystyrene** (Disposable cutlery and plates, Styrofoam cups and trays, Egg cartons, Yoghurt containers etc., ) .....**kg**
- **Polyvinyl Chloride (PVC)** (Plumbing pipes, Vinyl flooring, Credit cards, Window frames, Medical tubing) .....**kg**
- **Aluminium** (Beverage cans, Foil wraps, Food trays, Aluminium cookware, Deodorant cans) ) .....**kg**
- **Glass** (Bottles (e.g., for beverages, sauces), Jars (e.g., for pickles, jams), Broken glassware, Windows, Light bulbs) ) .....**kg**
- **Paper and Cardboard** (Newspapers, Magazines, Cardboard boxes, Office paper, Paper bags, Paper cups) ) .....**kg**
- **Textiles** (Old clothes, Towels, Bed linens, Curtains, Rugs) .....**kg**
- **Metals (Iron, Steel)** (Old utensils, Iron rods, Steel cans (e.g., for food), Nails and screws, Metal furniture) .....**kg**
- **Electronic Waste (E-Waste)** (Old mobile phones, Batteries, Computer components, Televisions, Electrical wiring) .....**kg**

5. **Storage Capacity and Infrastructure:**

- **Volume Computation:**

- Calculate the volume required to store recyclables until collection by recyclers. Below are the normal bale sizes in which they are picked up by the recyclers. Depending on this nominal ranges, calculate the storage space required for your panchayat

#### **Polyethylene (PE)**

- **Bale Size:** 50-100 kg
- **Volume Required:** Approximately 0.3-0.5 cubic meters per bale

#### **Polypropylene (PP)**

- **Bale Size:** 100-200 kg
- **Volume Required:** Approximately 0.5-0.8 cubic meters per bale

#### **Polyethylene Terephthalate (PET)**

- **Bale Size:** 100-150 kg
- **Volume Required:** Approximately 0.5-0.7 cubic meters per bale

#### **High-Density Polyethylene (HDPE)**

- **Bale Size:** 50-100 kg
- **Volume Required:** Approximately 0.3-0.5 cubic meters per bale

#### **Low-Density Polyethylene (LDPE)**

- **Bale Size:** 50-100 kg
- **Volume Required:** Approximately 0.5-0.8 cubic meters per bale

#### **Polystyrene (PS)**

- **Bale Size:** 100-150 kg
- **Volume Required:** Approximately 1.0-1.5 cubic meters per bale (Polystyrene has low density, so it requires more space)

#### **Polyvinyl Chloride (PVC)**

- **Bale Size:** 50-100 kg
- **Volume Required:** Approximately 0.3-0.5 cubic meters per bale

#### **Aluminium**

- **Bale Size:** 100-200 kg
- **Volume Required:** Approximately 0.4-0.6 cubic meters per bale

#### **Glass**

- **Storage for Loose Glass:** Approximately 1 cubic meter per ton

- **Baled Size:** Not commonly baled, typically stored in bulk containers

#### **Paper and Cardboard**

- **Bale Size:** 100-300 kg
- **Volume Required:** Approximately 0.8-1.5 cubic meters per bale (depending on compaction level)

#### **Textiles**

- **Bale Size:** 100-150 kg
- **Volume Required:** Approximately 0.5-0.8 cubic meters per bale

#### **Metals (Iron, Steel)**

- **Bale Size:** 500-1000 kg
- **Volume Required:** Approximately 1.5-2.0 cubic meters per bale (varies greatly depending on compaction)

#### **Electronic Waste (E-Waste)**

- **Bale Size:** Varies widely; not commonly baled
- **Volume Required:** Typically stored in containers requiring approximately 1-2 cubic meters per ton

#### **Panchayat Infrastructure:**

- Assess whether the panchayat has adequate infrastructure for storage.
- If not, determine if the panchayat is willing to allocate land and build the necessary infrastructure.
- Attach a letter of intent from the panchayat regarding land allocation and infrastructure development.

#### **6. Cost Comparison and Feasibility Analysis:**

- **Cost Estimation:**
  - Estimate the costs incurred by the panchayat for waste management annually with the management practices they are now practicing- Probably refer to their ledger book for their pricing
  - Approximate the potential cost recovery for the village through the Garbage Bank project. Here is the approximate cost offered by the recyclers
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<b>Recyclable Material</b>	<b>Estimated Price (₹/kg)</b>
Polyethylene (PE)	10-20
Polypropylene (PP)	20-30
Polyethylene Terephthalate (PET)	15-35
High-Density Polyethylene (HDPE)	25-40
Low-Density Polyethylene (LDPE)	8-15
Polystyrene (PS)	5-15
Polyvinyl Chloride (PVC)	10-20
Aluminium	90-150
Glass	1-3
Paper	5-10
Cardboard	8-15
Textiles	10-20
Metals (Iron, Steel)	15-30
Electronic Waste (E-Waste)	20-50

This table provides a general range of prices, but actual prices may vary based on local market conditions.

- **Feasibility Analysis:**
  - Analyze the overall feasibility of the project, considering cost recovery and infrastructure development.

#### 7. Training and Application Interface:

- **Training Sessions:**
  - Approved proposals will require a 2-day training session for the principal investigators (PIs) from participating institutes, along with panchayat representatives, at IIT Madras.
- **Application Interface:**
  - Post-training, an application interface will be provided to track the status of recyclables collected daily.
- **Recycler Identification:**
  - The PI, with the assistance of IIT Madras and Garbage Bank, will be responsible for identifying recyclers to auction the recyclables.

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#### Evaluation Criteria for Proposal Selection:

1. **Comprehensive Village Profiling:**
  - Accuracy and depth of village profiling, including population, waste generation points, and existing collection systems.
2. **Waste Quantification and Segregation Analysis:**
  - Detailed assessment of waste types and segregation efficiency at the source and by panchayat workers.
3. **Infrastructure Readiness:**
  - Evaluation of existing infrastructure and the feasibility of developing additional infrastructure based on the proposal.
4. **Cost-Benefit Analysis:**
  - Clarity in cost estimation and the potential for cost recovery through the Garbage Bank initiative.
5. **Panchayat Engagement:**
  - Strength and clarity of the panchayat's commitment, as evidenced by the letter of intent and willingness to provide land and infrastructure.
6. **Feasibility and Sustainability:**
  - Overall feasibility of the proposal in terms of long-term sustainability, recycler engagement, and effective implementation of the Garbage Bank system.

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**Note:** Selected proposals will undergo further scrutiny and must demonstrate strong alignment with the program's goals of sustainable waste management and community engagement.

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This guideline document serves as a framework for participating institutes to create thorough and impactful proposals that address the specific needs of the villages they are engaged with, ensuring the successful establishment of Garbage Banks across India.