Implementation of Operational Guidelines for Home Composting in Telangana

Training Manual for Municipal officials and Field functionaries
DISCLAIMER

This training material has been prepared by CDMA, MEPMA, Telangana with support of Urban Management Centre (UMC) for providing training to members of Self Help Groups / Slum Level Federations / Town Level Federations and Municipal officials for Implementation of Home Composting in Telangana. This training material has been prepared for the exclusive use and benefit of the SHGs and DAY-NULM functionaries. If any part of this training manual is reproduced or replicated, CDMA, MEPMA, Telangana and UMC shall be acknowledged.
About the Training Manual

THIS MANUAL HAS BEEN PREPARED FOR

• **Primary Audience:** The Community Resource Persons, members of Self-Help Groups/Slum Level Federations/Town Level Federations, Municipal officials

• **Secondary Audience:** Households, Resident Welfare Associations, Institutions, Commercial establishments, etc.

**DURATION**

02:30 Hours
Objective of the Training Manual

- The importance of home composting
- The process of home composting
- Methods of home composting
- State level implementation strategy
- Roles and responsibilities of various Stakeholders
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Let’s Understand what is solid waste?
What is waste?

• Any material that is discarded because it has served its purpose is called WASTE.
• It is understood as “unwanted” or “useless” material…
Where does waste come from?
Where does waste come from?
Yes... everyone generates waste !!
An average person generates ½ kilo of waste every day..
A family of about 4 persons generates two kilos of waste every day or almost **one tempo full of waste per year (one ton)**.
Population is growing, city areas are expanding, and with increasing consumerism, we end up generating too much of waste.
How is waste managed in our cities?

1. Waste generation
2. Source segregation of waste
3. Collection of segregated waste
4. Transportation of waste to the processing facilities
5. Disposal of inert waste at dumpsite
Current scenario in Telangana

- Total Waste generated in a day: 4300 MT = 1720 waste collection vehicles (approx.)
- Percentage of waste collected through Door to Door Collection: 92%
- Percentage of Waste segregated: 39%
- Total 141 Cities in the State
- 52 cities targeted for the first phase
Now let’s see..
What all is there in our waste dump?
Types of Waste

- Bio-Degradable
- Non-Biodegradable
Biodegradable/ wet waste?

Type of waste, typically originating from plant or animal sources which may be degraded by other living organisms…. like food and kitchen waste
Non- Biodegradable waste?

- Waste
  - Bio-Degradable
  - Non-Biodegradable
    - Recyclable
    - Non Recyclable
Recyclable Waste

Recycling is the process of making or manufacturing new products from a product that has originally served its purpose...like paper cans, metal, certain plastics more than 40 micron
Non-Recyclable Waste

This is waste that is considered as trash once discarded...like certain plastics, thermocol cups, plastic cups, bags, diapers, sanitary napkins
When 4300 MT of waste is generated?
What do you think, where does it go?
Garbage thrown out of the city
Is their any solution to treat the waste?
Now lets see ..
How to treat the wet waste?
Wet waste can be treated at 3 levels

- Household level
- Community level
- City level
The operational guidelines for Home Composting issued by CDMA, Government of Telangana


GOVERNMENT OF TELANGANA
MUNICIPAL ADMINISTRATION DEPARTMENT

Circular

Rec.No. 3077/2020/01.

Sub: M.A Department - Operational Guidelines for Home Composting - Certain instructions issued - Dtd. 30.02.2021

Ref: This office Cr. No. 2877/2020/01, Dtd. 14-06-2020 addressed to all the Municipal Commissioners.

The attention of all the Municipal Commissioners is invited to the subject cited, wherein instructions were issued regarding the techniques on home composting and also the steps to be taken up for creating awareness among the public. It was also informed to involve the SWM women (Swatch Yatra) through S/TF for taking up home composting and that the trained SHAs shall be assigned about 500 households in their locality so that they can educate the households through simple home composting techniques and ensure that home composting is done at household level. The SHA members can be paid at a rate as agreed per HH Bulky waste generator, after successfully continuing composting activity for a period of 3 months and shall be certified by the office looking after sanitation in the municipality.

In this connection, it is further informed that apart from composting at household level, Bulky composting has to be taken up at Apartments/Residential complexes and by Bulky waste Generators so that the pressure on dumpsite or processing plants is reduced.

3. In view of the above, it is decided to establish a home composting unit at ULA level involving the Town Welfare Coordinator, Environmental Engineer, Sanitary Supervisor/Sanitary Inspector, Community Organizer/Community Resource Persons and RMs for taking up the following activities:

1. All the Municipalities/Municipal Corporations are instructed to identify the Grand Community/Apartments and Commercial establishment (Hotels/restaurants etc.) and any other Bulky Waste Generators (BWGs) where Bulky composting can be taken up in the ULA.

2. In the first phase, a minimum of 5% of the total residential complexes/households and 5% of the BWGs of the Municipalities/Municipal Corporations shall be targeted for Bulky composting.

3. The M&Ms/APAs shall conduct Training of Trainer (ToT) for CRPs and Municipalities/Municipal Corporation functionaries on Bulky composting to create awareness among the citizens to practice home composting and monitor the home composting activities at the ground level.

4. The duty of the CRPs shall be to create awareness among the allotted residential complexes/households and BWGs and ensure that Bulky composting is done by them and only Bulky waste is collected from the houses.

5. The nominated CRPs can be paid at a fixed rate of Rs.150/- per each dwelling unit/flat (listed community/Apartments) and Rs.250/- per each commercial establishment (Hotels/restaurants and other BWGs) etc where Bulky composting is being done. The record of evidence shall be...
The operational guidelines for Home Composting issued by CDMA, Government of Telangana
What is Home Composting?

“What home composting is a simple technique for treatment of organic waste at household or institutional level to produce compost through natural processes”
What are the benefits of Composting?

<table>
<thead>
<tr>
<th>Benefits of Composting</th>
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<tbody>
<tr>
<td>Treating the wet waste at source and minimizing the waste going to the landfill</td>
</tr>
<tr>
<td>Reduces the need for chemical fertilizers</td>
</tr>
<tr>
<td>Reduces the emission of harmful gases</td>
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<tr>
<td>Reduces the collection and transportation costs</td>
</tr>
<tr>
<td>Eliminates uncontrolled leachate at landfills</td>
</tr>
<tr>
<td>Reduces bad smell/odour at waste collection points and roads/streets</td>
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</table>
How to make compost?

1. Choose a place
   Ideal compost area is a dry, shady spot near a water source with dimensions of 3 x 3 x 3 feet.

2. Add the ingredients
   The ingredients are those rich in carbon (brown materials) and those rich in nitrogen (green materials). Make sure large materials are chopped or shredded.

3. Add water as needed
   Make sure the pile stays moist but not too wet (it should feel like a damp sponge).

4. Keep things moving
   Turn your compost mixture to add air to the mix. This helps speed up the composting process.

5. Wait a while
   When the compost no longer gives off heat and becomes dry, brown, and crumbly, it's fully cooked and ready to be fed to the garden.

Image Source: https://swachhindia.ndtv.com/
Essential ingredients for composting

Four basic ingredients are required for composting:

- Browns
- Greens
- Air
- Water
What are Browns and Greens?

<table>
<thead>
<tr>
<th>Browns</th>
<th>Greens</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Corn stalks</td>
<td>• Vegetable peelings</td>
</tr>
<tr>
<td>• Newspaper (Shredded)</td>
<td>• Rotten fruits</td>
</tr>
<tr>
<td>• Dry Leaves</td>
<td>• Coffee grounds</td>
</tr>
<tr>
<td>• Bark</td>
<td>• Tea leaves</td>
</tr>
<tr>
<td>• Straw</td>
<td>• Manure from herbivorous pets/animals</td>
</tr>
<tr>
<td>• Wood chips</td>
<td>• Egg shells</td>
</tr>
<tr>
<td>• Unprocessed cartons/cardboards (should be shredded), etc</td>
<td>• Tea bags</td>
</tr>
<tr>
<td></td>
<td>• Paper towels and napkins</td>
</tr>
<tr>
<td></td>
<td>• Yard/Grass trimmings, etc</td>
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</tbody>
</table>

Ideal ratio to be maintained = 3 : 1

Image Source: https://swachhindia.ndtv.com/
Methods of home composting

- At household level
- At Community level
Methods of Composting – Household level

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<thead>
<tr>
<th>Method</th>
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<td>Pit Composting</td>
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<td>Pot Composting</td>
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<td>Khamba/Matka/Three vessel composting</td>
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<td>Kitchen bin Composting</td>
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<td>Mose Pit Composting</td>
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</table>
Pit composting

Suitability
• For a family of 5-6 members,
• Pit size: 100cm X 60 cm X 100 cm
  (3.5 ft X 2ft X 3.5ft)

Infrastructural requirements
• Shovel
• Tarpaulin/plastic sheet
• Cow dung/decomposed waste and soil

Compost will be ready in 120-180 days
Steps – Pit Composting

1. Identify a spot in your plot where water doesn’t get logged, and where two pits can be dug. Make a small bund around the pit.

2. In rainy season, cover the pits with the plastic sheet.

3. At the base, spread a 6-inch layer of decomposed waste or cow dung slurry.

4. Cut the wet waste into small pieces. Spread it on this base layer. Make sure that the waste put in is moist.

After every layer of waste, sprinkle a layer of soil to avoid any bad odour and prevent breeding of flies.

Continue doing this until there is about 15 cm of space in the pit.

Fill this space with soil. Leave the pit for a minimum period of 4 months.

Once the first pit is closed, use the second pit in a similar manner.

To use the compost, just dig the pit, and unearth the compost. It can be directly used for soil enrichment.

https://www.youtube.com/watch?v=ISHHGIQYdA0&feature=youtu.be&ab_channel=GrowVeg
Steps – Pit Composting

1. Identify a place where water doesn’t get logged, and two pits can be dug.

2. Make a small bund around the pit.

3. Add shredded waste. The waste should be moist.

4. After every layer of waste, sprinkle a layer of soil.

5. Once the first pit is closed, use the second pit in a similar manner.

6. To use the compost, just dig the pit, and unearth the compost.
Pot Composting

**Suitability**
- Works for units which produce 1 to 2 kg of biodegradable waste daily

**Infrastructural requirements**
- Two mud pots (50 cm high and having a diameter of 35 cm) (1.64 ft high with diameter of 1.14 ft)
- 50 cm (1.64 ft) tall stands for holding each pot.
- A plastic vessel of half liter capacity to collect the leachate
- A small trowel
- One painting brush
- 1 brick cut in 2 pieces

Compost will be ready in 60 to 75 days
Steps – Pot Composting

Make a hole in the bottom of the pot and place it at a convenient place on the top of the stand. Put the plastic container below the hole to capture the leachate.

Start putting in shredded biodegradable waste into the pot. Close the pot with the lid. And make sure to not put in more than 2 kg of waste a day.

Cover every layer of waste with compost or soil. The waste needs to be turned thoroughly once in two days.

One week later, worms can be seen in the pot. These worms help in the composting process and will die in the next three weeks themselves. Do not try and kill them yourself.

Once the first pot is full, start using the second pot in similar fashion. By the time the second pot is filled with waste, the waste in the first one will have turned into compost.

The moisture content in the pot should be maintained. In case the quantity of water inside the pot is more, sawdust can be added to absorb the excess water.

During monsoons, cover the pots with the plastic cover and put two pieces of brick on it to prevent rainwater from entering the pot.

Sour curd or buttermilk will speed up the composting process.

Tips about leachate:
- Put some salt in the container collecting leachate. This will prevent the flies from hovering around.
- The leachate can be diluted with water and used as compost for plants.
- If the flies persist, two camphor tablets should be diluted in 25 ml of oil and this oil should be applied on the pot with a brush.

https://www.youtube.com/watch?v=1o4y8tCaw0A
Steps – Pot Composting

1. Add 2kgs of waste to the pot
2. Sprinkle a layer of soil/already prepared compost on it
3. Mix the waste properly for every two days
4. Worms can be seen in the pot. Do not try and kill them
5. Start using the second pot in similar process
6. The moisture content in the pot should be maintained
7. Cover the pots with the plastic cover to prevent rainwater from entering the pot
8. Sour curd or buttermilk will speed up the composting process
9. Within 60-75 the compost will be ready
Khambha Composting

Suitability
- Works for units which produce up to 2 kg of biodegradable waste daily

Infrastructural requirements
- 3 terracotta pots, having a height and diameter of 30 cm (0.98 ft) with lid for one pot.
  - Pots number 1 and 2 are open from the top as well as bottom.
  - The open part in the bottom is weaved with plastic wires.
  - Pot number 3 is open at the top, and closed at the bottom.
- Old newspapers
- Hand pump/sprayer
- Compost/Saw dust
- Steel fork

Compost will be ready in around 90 days
Steps – Khambha Composting

1. Place newspaper sheets at the bottom of the pot 1 and 2 to cover the mesh wiring. This is done so that no other material other than water would seep in the pot below.

2. Place the pots, one on top of the other, with the pot having a closed bottom (pot 3) at the bottom of the stack.

3. Start adding kitchen waste to the topmost pot. Spray diluted bio culture after every layer of waste (The ratio of bio culture to water is 1:50 to make diluted bio culture).

4. The water used for diluting bio culture should not contain chlorine. To ensure that, the water to be used should be left open in a wide vessel for two days.

5. Once the topmost pot is 3/4th filled, swap the position of the pot with the middle one, and start putting in waste into pot 2.

6. Turn the waste every two days without tearing the newspaper at the bottom.
Steps – Kambha Composting

While the second pot is being used to collect the waste now, the composting process will shrink the material in the first pot, and it will be ready to use again when the second pot is 3/4th filled with waste.

Swap the position of pot 1 and pot 2 again. Now, pot 1 is at the top again. The waste should now be collected in this pot again, until it is filled up to 3/4th of its capacity. Then the positions will have to swapped once more.

Continue doing this until one of the pots is filled. Empty the contents in the bottommost pot, and continue the process until pot 3 is 3/4th filled.

Once that is done, sieve the contents of the last pot to get the compost. Any material that cannot be sieved can be added to the topmost pot for further decomposition.

https://www.youtube.com/watch?v=cReeLzYBPTY
Steps – Khambha Composting

- Place newspaper sheets at the bottom of the pot 1 & 2 to cover the mesh wiring.
- Add wet waste in pot 1.
- After adding a layer of wet waste, Spray bio culture after every layer of waste.
- Once the topmost pot is 3/4th filled, swap the position of the pot.
- Turn the waste every two days.
- While adding the waste to 2nd pot, the composting process will shrink the material in the first pot.
- Continue doing this until one of the pots are filled.
- Sieve the contents in the pot and add the remaining material that cannot be sieved to the pot.
Kitchen Bin Composting

Suitability

• Suitable for composting at a household level with 5 to 6 members.

Infrastructural requirements

• One 25 litre plastic bin with lid
• 3 Plastic grow bags
• One small trowel
• Small fork

Compost will be ready in around 30 to 45 days
**Steps – Kitchen Bin Composting**

1. Place the plastic bag inside the bin.
2. Spread starter material in 1-inch-thick layer over the bottom as bio-platform*.
3. Spread the shredded waste over the starter layer.
4. Spray diluted bio-culture mixture over the waste. After third day, use the fork to mix the contents of old layer and new layer.
5. Repeat the procedure till the bin is filled.
6. Tie the grow bag and remove it and store it.
7. Keep the second grow bag inside the bin and continue the process.
8. Once the second bag is filled, remove it and store it. Open the first grow bag and remove the contents and start using it again. If the waste quantity is more than 2kg/day increase the number of grow bags to give at least 20 days of storing time for filled grow bag.

*Either prepared bio-compost or saw dust treated with bio-culture can be used as starter material. Mix saw dust with diluted bio-culture (bio-culture water ratio 1:50) and keep it in a sack bag duly tied. After two days, saw dust mixture becomes hot by the activities of the bacteria. This hot mixture can be used as the starter.
Mose Pit Composting

Suitability
• Suitable for composting at a household level with 5 to 6 members.
• 2 pits will have to be dug as each pit shall be used alternatively for 6 months.

Infrastructural requirements
• Circular pits of required diameter and depth 1m in a convenient location – 2 Nos
• Circular/ rectangular slabs to fully cover the pit, with PVC pipe of required diameter, 50cm long (1.64 ft long), vertically placed centrally on the cover slabs - 2 sets.
• PVC caps to close opening of the pipe – 2 Nos

Compost will be ready in around 30 to 45 days
Mose Pit Composting

Size and specification of the infrastructure required:

- **Pit of size 60cm diameter and depth 1m** for a family of 5 members. (1.96 ft dia and 3.28 ft depth)
- Diameter of the pit may go up to 1.5m (in 4.92 fts) for institutions
- Restrict the depth to **minimum 1m (1.96 Ft)** in all cases as methanogenic activities get reduced at lower depth.
- The bottom of the pit is of oval shape.
- The **cover slab of size 75cm (2.46 Ft) diameter (for a pit of 60cm diameter) and thickness 7.5cm.** (In feet's - 2.46 ft size of slab ; For a pit 1.96 ft dia and thickness of 0.24 ft)
- PVC pipe of **100mm** (in feet's - 0.32 ft) **dia. for domestic type and can be upto 200 mm (in feet's - 0.65ft) ( diameter for bigger size pits.**
Steps – Mose Pit Composting

Ensure bacterial seeding before putting the waste into the pit by sprinkling cow-dung/decomposed waste into the pit.

Drop the shredded bio-waste into the pit through the pipe opening daily and keep the pipe end closed always.

Pouring of warm water of 35° to 45°C temperatures once in a week will accelerate the decomposing.

Occasionally pouring of cow-dung mixture or any bacterial seed into the pit will be helpful.

Keep using the pits alternately for six months each.
Methods of home composting

- At household level
- At Community level
## Methods of composting - Community level

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<td>Rotary Drum/In vessel composting</td>
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<td>Drum Composting</td>
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<tr>
<td>Organic Waste Composter (OWC)</td>
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<tr>
<td>Steel Mesh Composter</td>
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</table>
Rotary Drum/In-vessel Composting

Suitability
- Suitable for up to 10 households, daily waste intake up to 10 kg

Infrastructural requirements
- A rotary drum of 250 litres capacity

Compost will be ready in around 15 to 20 days
Steps – Rotary Drum/ In-vessel Composting

- The waste is shredded and added to the drum.
- The handle of the drum is used to manually turn the waste once every day.
- Make two to three rotations.
- After the rotation, the half doors at the side of the drum should be opened.
- Continue the process for 15 days

https://www.youtube.com/watch?v=1Aj0cEF5FWM
Steps – Rotary Drum/ In-vessel Composting

1. Add the shredded waste to the drum
2. Turn the waste once every day using handle
3. Make two to three rotations
4. Within 15-20 the compost will be ready
Drum Composting

Suitability
- For institutions or a large number of apartments

Infrastructural requirements
- 2 drums of 50 liters each
- A pedestal for the drum
- A tap
- Plastic vessel of 5-liter capacity
- Plastic net bags
- Two bricks
- Gloves

Compost will be ready in 15-25 days
Steps – Drum Composting

Take a plastic drum and fix the tap on the bottom of the drum.

Place this drum on a pedestal of suitable height to accommodate the plastic vessel below the tap.

Prepare the liquid culture by mixing an adequate amount of culture in water (For treating 80-100 kg of waste, mix 250 ml of culture in 3 liters of water).

Segregate the waste and keep the waste which can be converted into compost in the net bags. Don’t put papers or materials which can be further used after recycling.

Put some bricks inside the drum in such a way that the bags carrying the waste do not block the tap (refer image).

In a large container, mix the waste with the prepared culture solution by wearing gloves in the hands.

After mixing the waste with the solution, put the waste in the plastic net bags and tie a knot by the plastic rope when it gets filled.

Put the plastic net bags in the drum. Continue this process until the drum gets filled.

Pour the remaining leftover solution of the container into the drum from the top and close the lid of the drum.
Connect a pipe from the tap of the drum to the plastic can.

Open the tap for collection of liquid.

Pour back the liquid collected till the third day back in the drum through the top, after opening the lid. Also, when the drum is opened on the third day, see whether the compost is uniformly converting or not. If not, then add more liquid solution (250ml culture mixed with 3 litres of water) to it.

On the 20th day of composting, take out all the net bags from the drum and spread the contents of the net bag on the ground to dry.

Whenever during the composting, if the process starts to smell then add some more culture (mixed with water) to it from the top of the drum. Increase in foul smell is an indication that composting is not going properly.

Put the can beneath the tap after pouring the liquid for collection of liquid compost.

The liquid left inside the drum is also the liquid compost, so collect it in the can.

After drying the solid waste for 2 days, sift it with a sieve. The collected solid is the solid compost.
Organic Waste Composter (OWC)

Suitability

- The technique of drum composting would work for 10-15 households.
- The waste processing capacity of a mechanized OWC ranges from 100 kgs a day to 5000 kgs of wet waste a day.

Infrastructural requirements

- Space requirement – 100 sq. meter to 500 sq. meter (1076 sq.ft to 5381 sq.ft) depending on the capacity of the OWC.
- A shed/designated space for the OWC
- Old compost/soil
- Culture
- Plastic racks for curing of compost

Compost will be ready within 24 hours

However, this compost should be cured for some days before using it. Put the compost in plastic crates and leave it for at least a week (longer the curing period, better is the quality of the compost). During this time, keep the compost slightly moist.
Steps – Organic Waste Composter

1. Shred the biodegradable waste into small pieces before putting it in the OWC.
2. Add culture and old compost to the waste.
3. Switch on the OWC, and the compost can be collected after 24 hours.

The collected compost should be collected in the racks, and left for a few days to cure it. During curing, water should be sparsely sprayed to retain the required moisture.

The compost can then be used in the garden.

https://www.youtube.com/watch?v=1Aj0cEF5FWM

Steel Mesh Composter

**Suitability**
- Works for a cluster of houses
- One unit has the capacity to hold waste of 50 kg per day

**Infrastructural requirements**
- Space requirement – 500 sq. meter (5381 Sq.ft)
- A shed/designated space for the composter
- Cement slabs
- Steel mesh plate for the top (should be equal to the size of the compost)
- Steel mesh ring (to install inside the composter).
- Saw dust

Compost will be ready in 30 days with 30 days for curing time
Put together a square-shaped platform using a few cement slabs.

Leave some gap between each slab so that leachate, if any, drips down easily.

Place a steel mesh plate on top of the slabs to prevent entry of rodents from the bottom.

Make a steel mesh ring of 3 ft diameter and 2.5 ft height (open cylinder).

Place this ring on the platform.

Wrap the ring with gunny sack to avoid the contents from spilling out and messing up the surroundings.

This also prevents rodents from digging into the piles.

Collect the segregated kitchen waste.

Sprinkle little bit of saw dust on it to absorb excess moisture.

Source: https://www.pdotwolf.com/shop/garden/composters/500ltr-garden-waste-compost-bin-wire-mesh/

https://www.youtube.com/watch?v=Tj_goluMKO8&feature=youtu.be&ab_channel=judopuff
Spread a thick layer of (at least 8-10 inches) dry leaves at the bottom of the composter. This absorbs the moisture content seeping down from the top layers. Add the bio degradable waste and dry leaves to the composter in alternative layers. The top portion is always filled with dry leaves to avoid flies, odour, mosquitoes and rodents.

Leaving the composter for about 15-20 days. Churn the waste after 15 days. Afterwards remove and lay it for maturing for another 30 days. After a total of about 45 days, the compost is ready. Sieve it and store it for consumption. Bigger and not fully composted parts sieved out are once again added to the composter for composting.

Keep the place tidy and ensure that it is airy and covered (to save from sun and rain).
## Comparative Matrix

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<tr>
<th>Method</th>
<th>Suitability</th>
<th>Quantity of waste input (per day)</th>
<th>Type of process</th>
<th>Time frame</th>
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<td><strong>Composting methods for individual household units</strong></td>
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<td>Pit Composting</td>
<td>For a family of 5-6 members</td>
<td>Maximum 2000 kgs</td>
<td>Easy</td>
<td>120 – 180 days</td>
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<tr>
<td>Pot Composting</td>
<td>Units which generated 1 to 2 Kgs of waste daily</td>
<td>1 to 2 Kgs</td>
<td>Easy</td>
<td>60 – 75 days</td>
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<tr>
<td>Khamba/Matka/Three vessel composting</td>
<td>Individual HHs</td>
<td>2 kgs</td>
<td>Easy</td>
<td>Around 90 days</td>
</tr>
<tr>
<td>Kitchen bin Composting</td>
<td>Individual HHs</td>
<td>2 kgs</td>
<td>Moderately easy</td>
<td>60 – 75 days</td>
</tr>
<tr>
<td>Mose pit composting</td>
<td>For a family of 5 members</td>
<td></td>
<td>Moderately easy</td>
<td>30 to 45 days</td>
</tr>
<tr>
<td><strong>Composting methods for communities, institutional establishments/BWGs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rotary Drum/In vessel composting</td>
<td>Upto 10 HHs</td>
<td>Daily waste intake upto 10Kgs</td>
<td>Easy</td>
<td>15 to 20 days</td>
</tr>
<tr>
<td>Drum Composting</td>
<td>10 – 15 HHs</td>
<td>80 – 100 Kgs of waste</td>
<td>Moderately easy</td>
<td>22 to 25 days</td>
</tr>
<tr>
<td>Organic Waste Composter (OWC)</td>
<td>Large number of apartments and institutions</td>
<td>100 – 5000 kgs</td>
<td>Easy</td>
<td>24 Hours and the collected compost from OWC shall be cured for a few days</td>
</tr>
<tr>
<td>Steel Mesh Composter</td>
<td>Community level</td>
<td>Each unit can hold a waste of 50 Kgs</td>
<td>Moderately easy</td>
<td>30 days</td>
</tr>
</tbody>
</table>
# Do’s and Don’ts

<table>
<thead>
<tr>
<th>What’s In</th>
<th>Browns</th>
<th>What’s Out</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greens</td>
<td></td>
<td>Cooked food that may become moldy</td>
</tr>
<tr>
<td>Vegetable peelings</td>
<td>Corn stalks</td>
<td>Fatty food items</td>
</tr>
<tr>
<td>Rotten fruit</td>
<td>Newspaper (Shredded)</td>
<td>Leftover meat, cheese</td>
</tr>
<tr>
<td>Coffee grounds</td>
<td>Leaves</td>
<td>Chemically treated fruit skins</td>
</tr>
<tr>
<td>Tea leaves</td>
<td>Bark</td>
<td>Fish and bones</td>
</tr>
<tr>
<td>Manure from plant eating pets/animals</td>
<td>Straw</td>
<td>Plastic material</td>
</tr>
<tr>
<td>Egg shells</td>
<td>Wood chips</td>
<td>Dairy products</td>
</tr>
<tr>
<td>Tea bags</td>
<td>Unprocessed cartons/cardboards (should be shredded)</td>
<td>Ash from barbecues or coal</td>
</tr>
<tr>
<td>Paper towels and napkins</td>
<td></td>
<td>Cartons and cardboard with plastic film, paper napkins used with chemical based cleaner</td>
</tr>
<tr>
<td>Yard/Grass trimmings</td>
<td></td>
<td>Straws, stirrers and twist ties</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Metal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Toxic chemical material</td>
</tr>
</tbody>
</table>
Use of Compost

**Good Compost** – Good compost is identified by its color and smell; it should be dark brown to black in color which does not stink. It should be finely granular, such that 90% of it can be sifted by a 0.4mm sieve.

Potted Plants & Gardens

Can be sold
# Frequently occurring issues and their solutions

<table>
<thead>
<tr>
<th>Issue</th>
<th>Possible Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pile is wet and stinking</td>
<td>• Excess moisture • Compaction</td>
<td>• Add brown material • Turn Pile • Place browns at the center of the pile</td>
</tr>
<tr>
<td>Pile is dry</td>
<td>• Too much brown material • Too little water</td>
<td>• Add fresh kitchen scraps • Moisten with water • Cover pile to reduce evaporation</td>
</tr>
<tr>
<td>Pile attracting pests (birds, rodents, etc.)</td>
<td>• Inappropriate materials added and poor covering</td>
<td>• Adding of grease, oils, meats, breads, etc. shall be avoided (refer do’s and don’ts) • Add soil or brown material to cover food scraps • Put kitchen scraps in the center of the pile</td>
</tr>
<tr>
<td>Pile is not warm</td>
<td>• Pile too small • Too little moisture • Poor aeration</td>
<td>• Increase pile • Add water and turn pile • Turn pile</td>
</tr>
<tr>
<td>Pile attracting flies</td>
<td>• Improper covering of food scraps</td>
<td>• Cover green material with browns • Place kitchen scraps in the center of the pile • Add crushed dry leaves or add ready compost</td>
</tr>
<tr>
<td>Pile has excessive worms</td>
<td>• The pile is too wet</td>
<td></td>
</tr>
</tbody>
</table>
Implementation Strategy

- Setup a monitoring cell
- Awareness generation
- Identification of units for home composting
- Training & capacity building
- Forging partnerships at local level
- Defining roles and responsibilities of various stakeholders
- Monitoring & reporting
The implementation of home composting activity in the state will be led by CDMA and will have the following members:

**State Home Composting Cell**

- Deputy Director, CDMA
- Solid Waste Management (SWM) Expert, State SBM
- State Mission Coordinator (SMC), MEPMA
- Compost Development Officer (CDO), CDMA

The state cell shall conduct review meetings with the cities once a week.
Monitoring Cell - Municipalities / Municipal Corporation

- Shall conduct regular review meetings
- Act as a Helpdesk for the citizens.

The cell will have the following members

<table>
<thead>
<tr>
<th>For Municipal Corporations</th>
<th>For Municipalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipal Commissioner</td>
<td>Municipal Commissioner</td>
</tr>
<tr>
<td>Medical Health Officer</td>
<td>Town Mission Coordinator</td>
</tr>
<tr>
<td>Environmental Engineer</td>
<td>Environmental Engineer</td>
</tr>
<tr>
<td>Town Mission Coordinator</td>
<td>Sanitary Inspector/ Sanitary Supervisor</td>
</tr>
<tr>
<td>Sanitary Inspector/ Sanitary Supervisor</td>
<td>Community Organizer/ Resource Person</td>
</tr>
<tr>
<td>Community Organizer/ Resource Person</td>
<td></td>
</tr>
</tbody>
</table>

Nodal officer for implementation, monitoring and reporting to State

The Cell shall monitor the progress on a daily basis.
Identification of properties for home composting at city level

The implementation of the home composting activity shall be taken up in phased manner

- The city shall identify a mix of individual households, Resident welfare associations, institutional establishments and bulk waste generators (BWGs)
- A minimum of 10% of total HHs and 50% of BWGs should be targeted in the first phase
- The city shall finalise the units, based on space availability and willingness of owners/managers
Ways of implementing home composting in the city

1. Implementation through CRPs
   • The CRPs shall:
     • Generate awareness
     • Identify the units
     • Guiding owners/managers on best technologies

2. Implementation through SLFs/TLFs
   • The SLF/TLF members shall:
     • Train and help the units in selecting a suitable composting technique
     • Handholding support to owners/managers
     • Spread awareness among other SHG members

3. Setting up Compost marts by SHGs
   • Compost mart is the place where the material and equipment required for composting is made available.
   • SHGs engaged in management of the compost mart will guide the buyers about its use
Training for home composting by Municipal officials and CRPs

<table>
<thead>
<tr>
<th>Unit owners/ Managers</th>
<th>SLF &amp; SHG Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training content will include:</td>
<td>Training content will include:</td>
</tr>
<tr>
<td>• Importance of source segregation and composting</td>
<td>• Awareness generation among the unit owners</td>
</tr>
<tr>
<td>• Methods available for composting</td>
<td>• Methods available for composting</td>
</tr>
<tr>
<td>• Steps to be followed for composting</td>
<td>• Equipment that would be needed to practice home composting</td>
</tr>
<tr>
<td>• Do’s &amp; don’ts of composting</td>
<td>• Do’s &amp; don’ts of composting</td>
</tr>
<tr>
<td></td>
<td>• Setting up and management of Compost mart</td>
</tr>
</tbody>
</table>
Awareness generation

What to inform?

With the support of Municipal officials, CRPs will sensitize RWAs, general public on
- Source Segregation
- Composting process
- Methods of composting
- Benefits of composting, etc.

How to inform?

- Digital Broadcast
- Advertisement on local channels
- Social media platforms
- Print media
- Audio visuals
- Live demonstration
Roles & Responsibilities

• Municipal Commissioner

• Town Mission Coordinator

• Environmental Engineer

• Community Resource Persons
### Roles of Municipal Commissioner

<table>
<thead>
<tr>
<th>Municipal Commissioner</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Set up a home composting cell at ULB level</td>
</tr>
<tr>
<td>▪ Issue ID Cards to CRPs</td>
</tr>
<tr>
<td>▪ Finalise the CRPs (from each ward) and appoint a nodal officer (preferably sanitary inspector/supervisor) for monitoring the home composting activities at ground level</td>
</tr>
<tr>
<td>▪ Finalization of action plan prepared by Town Mission Coordinator and Environmental engineer</td>
</tr>
<tr>
<td>▪ Finalisation of list of units (Gated Communities; Apartment and Other bulk waste generators) for home composting</td>
</tr>
<tr>
<td>• Finalising the models for implementation in the city</td>
</tr>
<tr>
<td>• Allocating the space for establishing a compost mart (in case of Municipality/ Municipal Corporation is willing to establishment compost mart model)</td>
</tr>
<tr>
<td>• Review and monitoring of ward level awareness programs on home composting</td>
</tr>
<tr>
<td>• Review the daily progress of on ground activities.</td>
</tr>
<tr>
<td>• Submit the progress to the state home composting cell on weekly basis</td>
</tr>
</tbody>
</table>
## Roles of Municipal Officials

<table>
<thead>
<tr>
<th>Roles and responsibilities</th>
<th>TMC</th>
<th>Environmental Engineer</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Prepare the instructions for formation of cell</td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Identify/ Nominate the CRPs (from each ward) for implementation and monitoring of home composting activities at ground level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Provision of ID Cards to the nominated CRPs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Identify the master trainers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Preparation of action plan for implementation in consultation with Environmental Engineer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Review the action plan once in a month and updating it accordingly</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Cont’d..)
# Roles Municipal Officials

<table>
<thead>
<tr>
<th>Roles and responsibilities</th>
<th>TMC</th>
<th>Environmental Engineer</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Finalisation of unit (Gated Communities; Apartment and Other bulk waste generators) in consultation with Environmental Engineer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Finalizing the models for implementing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Identify the SLFs (ward wise) for conducting training for unit owners/managers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Identify the SLFs/SHGs interested in implementing compost mart</td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Ensures that ward wise awareness programs conducted</td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Reviews and Monitors the progress of CRPs and submit the progress to Municipal Commissioner (with support from Environmental Engineer)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Roles of CRPs

<table>
<thead>
<tr>
<th>Roles and responsibilities</th>
<th>Only CRP</th>
<th>Sanitary inspector/supervisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Identify/Locating the Gated Communities, Apartments, Hotels and other Bulk waste generators in their respective ward</td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Sharing the details with Town Mission Coordinator as per the prescribed format</td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Awareness generation at community Level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Conducting trainings for SLFs and TLFs for awareness generation in their respective wards</td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Training of the HHs/unit owners or managers to understand the process of home composting and its techniques</td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Weekly visits to the HHs/communities practicing home composting for monitoring purpose</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Reporting and Monitoring

CRPs shall update the daily progress of on ground activities through the monitoring tool.

Home composting cell at city level shall review the progress and resolve the issues, if any, and update the progress to the state monitoring cell.

State home composting cell shall monitor the daily progress shared by city composting cell.
Thank You