2019

DRAFT POLICY ON DECENTRALISED COMPOSTING

GNIDA CITY POLICY 2019

GREATER NOIDA INDUSTRIAL DEVELOPMENT AUTHORITY

Contents

1. BACKGROUND

Composting is the most sustainable option for managing organic waste. Composting food waste and other acceptable organic waste at a licensed composting facility produces a beneficial product that is otherwise wasted in the landfill. Composting is an easy and cheap way to make nutrient rich fertilizer. It is a good initiative to get rid of kitchen waste, yard clippings, leaves, and other materials that you normally need to sweep up and throw out and send them to the landfill sites.

A landfill site has a limited life, but a composting plant or pit can continue to process waste indefinitely and will also add value to the soil. By taking responsibility for diverting recoverable waste produced in the houses and locality we are helping to improve the sustainability of the city at large.

2. WHY COMPOSTING

City composts contain all 17 required micro-nutrients, derived from the biodegradable food wastes they are produced from, and can counter the galloping depletion of micro-nutrients in Indian soils since heavy chemical-fertiliser use began to be used for intensive cultivation. We are currently deficient in as many as 8 micro-nutrients.

Compost used with synthetic fertilizers makes crops more pest-resistant by strengthening their root-systems, reducing pollution by excessive and needless pesticide use.

The benefits of the composting at the local level:

- Turning waste into a value-added resource for the locality and the city.
- Extending the life of the region's only landfill.
- Preventing greenhouse emissions and leachate caused by decomposing organic landfill waste.
- Producing valuable products, such as compost and fertilizer that enhance soil and aids in plant growth.

2.1 Composting helps in Saving Environment

Composting is an effective way to reduce greenhouse gases. By composting, the generation of greenhouse gases, particularly methane, is avoided. Backyard composting or community composting will produce negligible greenhouse gas emissions.

Composting also has “upstream” benefits, which further conserve our resources and reduce greenhouse gas emissions. The research has shown that when this compost is used on fields, it displaces synthetic chemical fertilizers. Fertilizer production requires intensive fossil fuel energy and seriously impacts human and environmental health.

Benefit of compost to environment:

a. The greenhouse gas emissions related to fertilizer production are avoided.
b. There is significant reduction in the use of pesticides (avoiding emissions associated with their production).
c. Improves health and workability of soils, resulting in less fuel consumption to till the soil.

d. Helps soils hold or sequester carbon dioxide. In addition to emission reductions, compost replenishes and revitalizes exhausted farm soils by replacing trace minerals and organic material, reduces soil erosion and helps prevent storm water runoff.

2.2 How Compost Helps Soil Structure

a) The advantage of using compost is in its prevention of erosion of soil. Compost loosens tightly bound particles in clay or silt, allowing roots to easily spread and thereby impeding erosion. Hand in hand with the prevention of erosion, compost also increases soil's ability to retain water and decrease runoff by encouraging healthy root systems. A five percent increase in organic material will quadruple the water holding capacity of soil. Decreasing water runoff helps to protect our waters by thwarting pollution from fertilizer, pesticides and general soil runoff.
b) The addition of compost adds nitrogen, phosphorous and potassium as well as micro-nutrients such as manganese, copper, iron and zinc. While these micro-nutrients are only needed in small amounts, they are important contributors to a plant's overall health. Commercial fertilizers are often lacking in micro-nutrients, so compost is an added boon to the health of your plants. As compost rots, some materials break down more rapidly than others, in effect becoming a sort of slow release fertilizer. The greater variety of ingredients in the compost, the greater variety of nutrients will be released. Amending the soil with compost will also neutralize both acidic and alkaline soils, bringing the pH levels to an ideal range for nutrient absorption by plants.
c) A compost-amended garden also attracts earthworms, centipedes, sow bugs, redworms and others. Their presence proves that there is still organic material breaking down as it passes through their digestive systems and represents a balanced ecology. The existence of these little guys burrowing through the earth also aerates the soil.
d) Other Advantages of Using Compost Compost-amended gardens also tend to have fewer pest problems without the use of pesticides and are more resistant to disease as well. Compost that is predominantly leaf based has been shown to be effective against nematodes, and compost application to grass suppresses a multitude of fungal diseases. Lastly, composting is cost effective, decreasing the amount of cash outlay for garbage pickup, pesticides, herbicides, fertilizers and the like. Basically, using compost in the garden is a win-win situation all the way around.

3. VISION

"All the wards, institutions, hospitals, vegetables markets, fish/meat markers, industries, commercial areas, universities/colleges, multi apartments, resident welfare associations, houses over 100 sq mts, hotel/restaurants/banquets/ other eateries etc in GNIDA to achieve the decentralized composting of organic waste in their premises so as to reduce the waste going to the landfill sites.

4. GOAL

The City Decentralized Composting to ensure 100 percent processing of organic waste at the institutions, hospitals, vegetables markets, fish/meat markers, industries, commercial areas, universities/colleges, multi apartments, resident welfare associations, houses over 100 sq mts,

hotel/restaurants/banquets/ other eateries etc. for reducing the waste to be taken for landfill sites and adding value to the organic waste produced.

The policy specifically endorses the following core principles:

i. To reduce the waste going to the landfill sites
ii. Segregation of the waste at the primary level in organic, inorganic and hazardous
iii. Further segregation of inorganic and hazardous waste
iv. To protect the environment and the City valuable land resources
v. Treatment of organic waste at the local level so that value addition is done to the waste
vi. Promoting segregation of the waste at the household level and recycle & reuse of the waste at the household, commercial and institutional and other level
vii. To make the decentralized composting at the commercial, residential, industrial and the institutional level economical and environmentally sustainable.
viii. Ensuring, protecting and proper use of the compost produced at local level.
ix. Exploring Public Private Partnership (PPP) at the commercial, residential, industrial and the institutional level for compost production and marketing.
x. Public outreach for environmental and health related outcomes.
xi. Establishment of an efficient, effective, affordable and accountable system for managing the decentralized compost production and its uses

5. OBJECTIVES

To overcome the problem of collection, transportation and disposal of the waste at the landfill sites and convert the organic waste into meaningful product like useful manure/fertilizer so that the same may be used for gardening, horticulture or cultivation.

a. To ensure 100 percent decentralized composting at residential, institutions, hospitals, vegetables markets, fish/meat markers, industries, commercial areas, universities/colleges, multi apartments, resident welfare associations, houses over 1000 sq mts, hotel/restaurants/banquets/ other eateries etc.

b. To improve the environment and reduce the filth on the road, parks, markets, water bodies etc.

c. To reduce the burden of the landfill sites and to reduce the transportation of the waste.

d. To ensure that the compost produced is used for meaningful purpose in horticulture, gardening or cultivation

e. 100 percent segregation of the waste into organic, inorganic and hazardous waste

f. To ensure only inorganic waste is collected at the local level and the dry waste to be further segregated and sold.

g. Hazardous waste to be handled separately as per the norms laid out in the rules

h. E-waste to be handed over or sold to only the recognized agency by the RWA/ associations/industries etc. on their own

i. Sanitary napkins, adult and baby diapers to be handled separately and to be incinerated locally

6. COMPOSTING PROCESS

6.1 Process Biology

Different organisms already present in Municipal Solid Waste (MSW) are known to play a predominant role in breaking down biodegradable constituents of MSW. A succession of microbial growth and activity among the bacteria, fungi, actinomycetes, yeasts, etc. takes place during the process, whereby the environment created by one community of microorganisms encourages the activity of a successor group.

Stage # 1: Thermophilic Stage- Heat Generation (Sanitization)

This is the first phase of composting wherein microorganisms decompose the easily degradable organic substances producing heat as a result of intense metabolic activity.

Stage # 2: Mesophilic Stage

In the second stage, due to reduction in available food and nutrients, the microbial activity reduces, causing a decline in the temperature of the heap.

Stage # 3: Curing Stage

Curing of compost is done after the material from the windrow is screened. The screened material is then allowed to mature by curing stage. This is a very important phase in the composting process.

6.2 Physical and Chemical Parameters

Moisture: Moisture is a critical factor in composting because the microbes need moisture for survival and growth. Moisture tends to occupy the free air space between the decomposing particles.

Aeration: The composting process requires adequate supply of oxygen for biodegradation by microorganisms. Under aerobic conditions, decomposition rate is 10–20 times faster than under limited oxygen supply or anaerobic conditions.

Carbon to Nitrogen Ratio: MSW in India has a general carbon-to-nitrogen (C/N) ratio of around 30:1, which is ideal for decomposition. The organisms involved in stabilization of organic matter utilize about 30 parts of carbon for each part of nitrogen.

Temperature: Under properly controlled conditions, temperatures are known to rise beyond 70°C in aerobic composting. This increased temperature results in increased rate of biological activity and faster stabilization of the material.

Particle Size: The optimum particle size should have enough surface area for rapid microbial activity with enough void space to allow air to circulate for microbial respiration. The feedstock composition can be manipulated to create the desired mix of particle size and void space.

7. COMPOSTING TECHNOLOGIES AND APPLICABILITY

Name of the Technology	Suitability			
	Individual Households, Small Communities, Apartments etc. up to 10 Households	Medium Sized Communities, Apartments, RWAs - for 11 – 300 Households; medium sized Offices, medium Hotels, Resorts, medium Schools, Canteens, Marriage Halls	Large Communities, Apartments, RWAs, high rise buildings for 301 – 1000 Households; Large Offices, Large Hotels, Large Schools	Decentralized plants for above 1000 Households operated by ULBs / Institutions / Outsourced agencies
Pit Composting	✓	×	×	×
Pot Composting	✓	×	×	×
Tri Pot Composting	✓	×	×	×
Ring Composting	✓	×	×	×
Kitchen Bin Composting	✓	×	×	×
Drum Composting System	✓	×	×	×
Rotary drum composting	✓	×	×	×
Vermi Composting	×	✓	×	×
Biomethanization	×	✓	✓	✓
Organic Waste Composting Machine (fully automatic)	×	✓	✓	✓
Windrow Composting	×	×	×	✓

8. SEGREGATION OF WASTE AT SOURCE

a. All the waste generated will be segregated at the source by the residential, institutions, hospitals, vegetables markets, fish/meat markers, industries, commercial areas, universities/colleges, multi apartments, resident welfare associations, and houses over 1000 sq mts, hotel/restaurants/banquets/ other eateries etc.

b. The waste to be segregated into three major categories organic, inorganic and hazardous waste

c. Only inorganic waste is collected at the local level and the dry waste to be further segregated in Multiple Resource Facility (for GNIDA colonies only) by the involvement of rag pickets/SHGs and sold into market.

d. The dry waste collected will be further segregated at the MRF which will be setup in a decentralized manner for GNIDA colonies. The segregation at these centers will be done by the Rag pickers or by the SHGs members. The dry waste only be to be sold to the empaneled kabari walas.

e. Hazardous waste to be handled separately as per the norms laid out in the rules

f. E-waste not to be mixed with the inorganic, organic or hazardous waste and to be kept separately. The e-waste is to be handed over or sold to only the recognized agency empaneled by GNIDA.

g. Sanitary napkins, adult and baby diapers to be handled separately and to be incinerated locally or handled as bio medical waste.

h. Plastic waste to be handled independently by the concerned bodies or to be handed over to the people as dry waste collectors only in case where the MRF is functional.

i. The bulk waste generators have to handle the plastic waste on their own and process it or dispose it to the empaneled kabari walas.

8.1 Vegetables Markets/ Restaurants

a. The vegetable markets will form an association and they will collectively hand over the waste to the waste collector for further processing of waste.

b. A user fee will be charged on monthly basis for the collection of the waste. The user fee will be charged from the market association per vegetable/fruit vendors shop wise, as fixed by the GNIDA CEO, the user fee may be revised from time to time based on the prevailing circumstances.

c. All the restaurants presently working in GNIDA have to manage their own waste and for that they can either buy waste composters individually or collectively with other restaurants nearby and process the waste collectively,

8.2 Bulk Waste Generators

a. As per the Solid waste Management rules 2016, all the establishments generating more than 100 kgs of waste per day basis will have to compulsory compost their waste in their premises.

b. In failing to do so after three months of the notification of the policy the authority will stop picking up the wet and the dry waste from their respective localities.

c. If the respective bulk waste generators don't start to process their wet waste even after three months a heavy penalty will be imposed upon them as decided by the CEO of GNIDA. No waste will be collected from the bulk generators after three months of the release of the policy.

9. ON LEGISLATION AND INSTITUTIONAL ARRANGEMENTS

a. Legislation and institutional arrangements for the development and use of compost shall be periodically reviewed.

b. Gaps shall be filled, and updating of the institutional arrangements with parallel legislation shall be made periodically to cope with varying circumstances and for this government shall notify an agency giving full power to take necessary action in this matter.
c. The role of the Government shall be fine-tuned and its involvement reduced to be regulatory and supervisory. Involvement of the stakeholders in compost production and marketing shall be introduced and expanded.
d. All new construction either by the builders/cooperative or individual have to submit their organic waste composting plan to get their plan approved.
e. All new institutions/universities/colleges, hotels, restaurants, commercial areas, multi apartments, and houses over 1000 sq mts, hotel/restaurants/banquets/ other eateries will have to get their plan passed after incorporating the organic waste composting option.

10. ON PUBLIC AWARENERSS

a) The public shall be educated through various means about the advantage associated with the composting and segregation of the waste and the importance of compost being produced.
b) Programs on public awareness shall be designed and conducted to promote the compost production and segregation.
c) Public awareness campaigns shall also be carried out to educate the public on the importance of domestic compost use and its advantage to the overall environment.
d) A conscious campaign has to precede the implementation of the decentralized compost policy. City level officials and other stakeholders with the neighborhood committees/RWAs etc to be involved to give the process a thrust.
e) A large public participation process will be planned so that the potential consumers may be identified and the public education program is carried out.
f) The school children will be made aware about the importance of compost and segregation so the message is easily disseminated in the localities.

11. ON THE HUMAN RESOURCES DEVELOPMENT

a. Capabilities of human resources in the management of composting shall be enhanced through training and continuous interaction.
b. Human resources performance will be continually appraised in order to upgrade capabilities and sustain excellence.
c. Applied research on relevant composting techniques with the help of institutions and other organisations working in this field will be carried out from time to time as per the need.
d. Transfer of appropriate technology suited for local conditions will be a primary target for the development activities and for adaptive research.

12. CITY-LEVEL IMPLEMENTATION STRATEGY

All the builders managed society, cooperative society and the colonies run by GNIDA will develop a plan in collaboration with GNIDA officials for the composting of the waste and issue a Compost Implementation Strategy and Plan Guidelines for all the stakeholders.

The Implementation Strategy will cover aspects such as implementation targets, framework for engagement of the private sector, training and capacity building, behavior change and social

communication, M&E framework, specific roles and responsibilities of various entities, guidelines to develop local level plans etc..

13. MONITORING & EVALUATION

GNIDA will develop an M&E framework to measure stakeholder's performance, and also devise data collection and reporting systems using indicator framework developed for the same. GNIDA will develop robust reporting format to track compliance of the various stakeholders with outcomes and process standards.

A cell will be created inside GNIDA to monitor and evaluate the composting being done. A Management Information System (MIS) will be developed accordingly to monitor the progress.

14. EXPECTED OUTCOMES

As this Policy is implemented in the city, it is expected to yield significant benefits in terms of improved public health indicators, considerable reduced pollution of water bodies and groundwater. Some key projected outcomes are:

i. Safe collection and processing of the organic waste for production of compost

ii. Continuous improvements in efficiency and effectiveness in the entire compost production by improved processing, its effective use, decrease in transportation charges and less land used for landfilling

iii. Contamination of water bodies and groundwater from mixed waste reduced to zero levels in GNIDA

iv. Nuisance from scattered and littered waste reduced to minimum levels, resulting in nuisance-free living space

v. Maximum reuse of organic waste at the city level and making wealth out of waste and paving the way for greening of the city.