



NOIDA



WET WASTE PROCESSING POLICY & GUIDELINES IN COMPLIANCE WITH SWM RULES, 2016

(2019-2020)

New Okhla Industrial Development Authority (NOIDA)
(Horticulture Department)
Sector-39, Noida



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1. Objective:

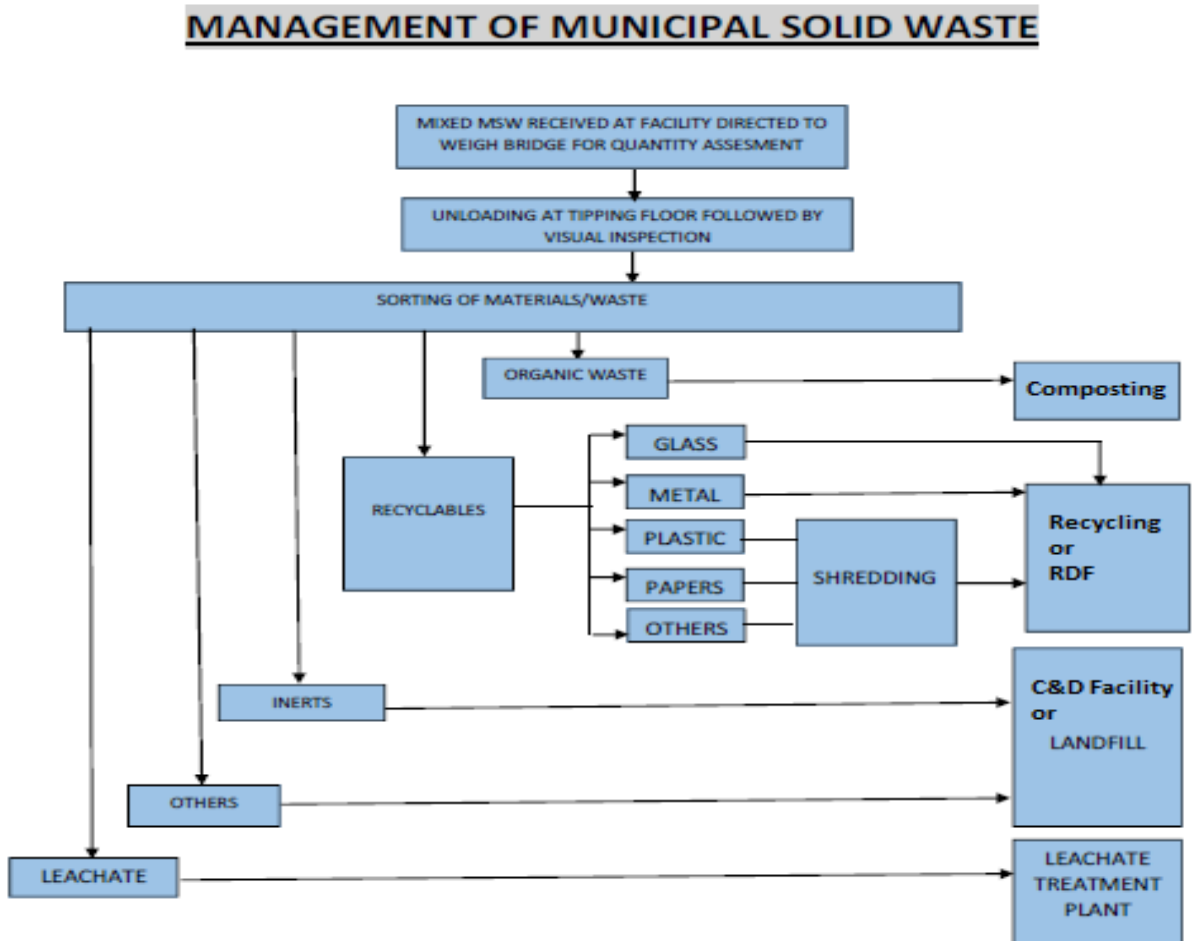
Every bulk waste generators need to ensure mandatory compliance with Solid Waste (Management and Handling) Rules, 2016. Also, in order to reduce the waste load on the landfill/ dumpsite and optimize the economics of waste transportation, decentralized waste management of the wet waste is required.

Noida Authority thus, look forward to implement decentralized waste management in a manner that almost every Bulk Waste Generators must follow the laid provisions and help the Authority to ensure compliant and sustainable waste management in Noida.

The deadline set for 100% compliance in this regard is March 31, 2020. After which Authority will initiate panel action against the defaulters/ violators. Prior to which Authority will ensure that every Bulk Waste Generators must get identified and notices for necessary compliance with the said SWM Rules, 2016 is served to all. Authority will also ensure that financial assistance, land availability, technology selection, rates negotiations/ contract etc is achieved at Authority's level.

As of today Noida is generating almost 600MT of waste per day and it is expected to grow @2-3% per year as population of Noida is ever increasing. Scientific waste management practices must be adapted especially for wet waste or in other words compostable waste without any further delay. Noida has already witnessed very severe objections and physical obstruction from its citizen for large landfill sites. It is thus, suggested that Noida should systematically promote decentralized scientific waste management practices with active participation from residents, corporates and other stakeholders.

The wet waste processing protocol is conceptualized to achieve the above object.



2. Wet Waste Composting

Composting involves the breakdown of organic waste by microorganisms in the presence of air, heat and moisture. This can be carried out on a small scale in households or on a large scale depending upon the quantity of waste to be processed and space available. Bacteria, fungi and actinomycetes act upon the waste to convert it into sugars, starch, and organic acids which in turn are acted upon by high-temperature loving bacteria, resulting in a stable product called City Compost.

2.1 SWM Rules 2016: Provision on Composting

- Clause 4 Duties of Waste Generators (Section: 6, 7, 8)
- Clause 15 Duties and Responsibilities of Local Authorities (Section: m, q, u, v)

2.2 Benefits of Composting

1. The economic benefits of compost use include improved soil condition, enhanced water retention capacity of soil, increased biological activity, micronutrient content, and improved pest resistance of crops.
2. Composting minimizes or avoids GHG emissions from waste.
3. Compost is useful as organic manure; it contains macronutrients (nitrogen, phosphorous, and potassium) as well as micronutrients. When used in conjunction with chemical fertilizers, optimum results are obtained.
4. Reduces dependency on chemical fertilizers
5. Compost can be used to revitalize impoverished soils and waste lands.
6. Compost may also be used as a bio matrix in remediation of chemical contaminants and as a remediated soil in contaminated sites where it helps in binding heavy metals and other contaminants, reducing leachate and bio-absorption.

2.3 Composting Process

Process Biology

Different organisms already present in 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. Different types of microorganisms are therefore active at different times and locations within the windrow depending upon the availability of substrate, oxygen supply, and moisture content of the organic matter.

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. In most cases with moisture content of 55%– 60% and air voids of 20%–30% in the windrow (garbage heap for composting), a temperature rise from 35°C to 55°C–65°C is achieved within 2–3 days.

Windrows are turned at regular intervals to expose inner material to air so that temperature in these fresh sections rises again, and gradually the whole windrow is sanitized from pathogens.

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. There is a shift in the type of microbial species. The composted material becomes dark brown during this stage due to humus synthesis and starts to stabilize.

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. Microbial species degrading complex polymers such as cellulose, lignin, etc., increase drastically during this phase. Bacteria represent 80% of composting microbes. Free living nitrogen fixing bacteria, de-nitrifiers, sulphate reducers and sulphur oxidizers are important constituents of the total microbial population.

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. Hence, when the moisture content is too high, anaerobic conditions set in and composting is affected.

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. C/N ratio below 25:1 results in foul smell and a higher C/N ratio will impede the decomposition process

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.

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. However, if the temperature becomes very high (>75°C), organisms and enzymes gets deactivated and the rate of activity may decrease.

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.

3. 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	×	×	×	✓



4. Selection of wet waste processing technology for NOIDA Authority

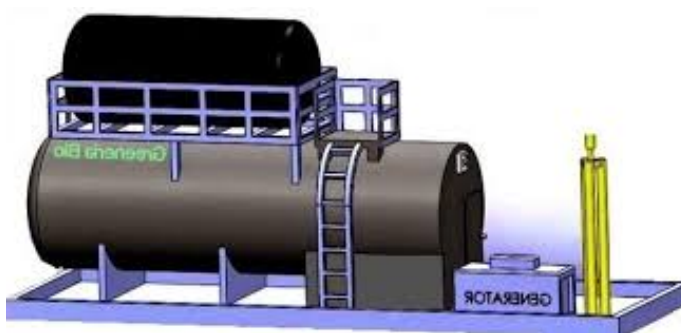
The proposed decentralized mechanism for Noida, would be as under:

✓ **Most favoured Decentralized Waste to Compost Technology:**
Option # 1 (Net Energy Positive Option)

- a) **Compact Containerized Biomethanization plant:** Organic Waste Processing Capacity 500Kgs, 1000Kgs, 2000Kgs and 5000Kgs on per day basis.

The waste inputs can be:

- Vegetables/ Food waste
- Horticulture waste
- Slaughter / Meat waste
- Animal dung
- Paper Waste



The output can be:

- Combustible fuel gas (methane)
- Bio-slurry (very rich nutrient compost, once dried)
- Gas can be converted into Electric energy or BIO-CNG
- No odour, no leachate, no environmental issue, small footprint thus less area requirement, hassle free economical operation and sustainable in most of the cases

Biogas plants are decentralized energy system that can lead to self-sufficiency in heat and power requirements, and at the same time reduces environmental pollution. A biogas plant stabilizes organic waste through natural biological process in the absence of air and transforms waste into biogas and bio-fertilizer. Such facilities are well-suited to wet organic material and are commonly used for treating biodegradable waste materials such as waste paper, grass clippings, leftover kitchen waste food, sewage and animal waste. The components of a modern biogas (or anaerobic digestion) plant includes manure collection, anaerobic digester, effluent treatment plant, gas storage, and CHP or electricity generating equipment.

Tentative Costing (Capex & Opex) of the product is as under:

Particulars	500Kgs	1000Kgs	2000Kgs	5000Kgs
Capex (One time)	Rs.20.0Lac	Rs.30.0Lac	Rs.48.0Lac	Rs.115.0Lac
Suitable for families	1000Nos. +15%	2000Nos. +15%	4000Nos. +15%	10000Nos. +15%
O&M Expense (Rs./ Mth.) Include all 3M resource	Rs.30,000/- +10%	Rs.50,000/- +10%	Rs.70,000/- +10%	Rs.1,40,000/- +10%
Human Resource	1	2	3	5
Electricity Consumption	25Kwh/ Day	45Kwh/ Day	80Kwh/ Day	200Kwh/ Day
Area Requirement (m2)	200	300	400	700

✓ **Waste to Compost Technology:**

Option # 2

- b) **Fully automatic mechanized waste to compost conversion machine:** The machine comes in many capacity and benefits as under:

The waste inputs can be:

- Vegetables/ Food waste
- Horticulture waste
- Slaughter / Meat waste
- Animal dungs
- Paper Waste



The output can be:

- Semi-compost material (with 2weeks curing converts in compost) but this semi-ready compost material can equally be used as compost/ soil conditioner.
- less odour, less leachate, no environmental threat, no much area requirement, hassle free operation

Machine operation - Fully automatic Parts of machine (SS-304 grade material)

- Shredder
- In-built heating system
- Mixing blades
- Composting tank
- Moisture control and air ventilation system
- Dehydrator (on customer demand) etc

The composter machine is a digestive system that functions with its special technique to decompose all sort of organic wastes within a short span of time. Bio-degradable wastes are converted into bio energy in our Organic Waste composter. With the right conditions (air and moisture), organic waste such as food and plant materials like grass and leaves can be decomposed by organisms like bacteria, fungi and worms. In this equipment, only biodegradable wastes are used for composting and this process turns the organic waste into nutrient rich compost and fertilizers that can be used in agriculture.

Tentative Costing (Capex & Opex) of the product is as under:

Particulars (fully automatic & SS make body)	100Kgs	300Kgs	500Kgs	1000Kgs	2000Kgs
Capex (One time)	Rs.8.0Lac	Rs.11.0Lac	Rs.19.0Lac	Rs.28.0Lac	Rs.40.0Lac
Suitable for families	200Nos. ±15%	600Nos. ±15%	1000Nos. ±15%	2000Nos. ±15%	4000Nos. ±15%
O&M Expense (Rs./ Mth.)	Rs.22,000/- ±10%	Rs.25,000/- ±10%	Rs.40,000/- ±10%	Rs.60,000/- ±10%	Rs.90,000/ - ±10%

Include all 3M resource					
Human Resource	1	1	1	2	3
Power Requirement	45Kwh/Day	100Kwh/Day	130Kwh/Day	225Kwh/day	400Kwh/day
Area Requirement (m2)	50	70	100	200	300

- ✓ **Most ecological and economical Waste to Compost Technology, recommended for area having larger green/ open space (rural area):**

Option # 3

- c) **Pit Composting/ Vermi Composting:** Here the waste can be converted to compost within a period of 25-30 days depending upon the climatic conditions and favorable condition for composting. Composting pits can be constructed in areas near the parks, societies, markets and should be lesser than 1.OTPD. This is to ensure meeting conditions for decentralized composting and to avoid stringent environmental clearance process of pollution control board. The process flow for pit based composting is given below:

The pit can be constructed with a dimension to handle 1 tonne of waste per pit. A size of 3mx2mx1m pit with honey combining can be constructed for this purpose. The waste to be mixed with inoculum or sugarcane husk and to be kept for a period of 30-45 days for aerobic conversion of the waste to compost. Such type of composting mechanism is good for small setup having 50-100 residential houses with



green cover and space to construct multi pits to accommodate daily waste. The only disadvantage with such practice is that it occupies lot of space with patience care particularly maintenance of moisture and dung management. Though the practice is economical but space requirement make it unfit for urban areas. Thus, such practices are best suitable for rural areas.

Tentative Costing (Capex & Opex) of the product is as under:

Particulars for Vermi Composting	100Kgs	300Kgs	500Kgs	1000Kgs	2000Kgs
No. of Pits requirement	8Nos	24Nos	40Nos	80Nos	160Nos
Capex (One time)	Rs.4.0Lac	Rs.10.0Lac	Rs.18.0Lac	Rs.32.0Lac	Rs.60.0Lac
Suitable for families	200Nos. +15%	600Nos. +15%	1000Nos. +15%	2000Nos. +15%	4000Nos. +15%
O&M Expense (Rs./ Mth.) Include all 3M resource	Rs.20,000/- +10%	Rs.30,000/- +10%	Rs.40,000/- +10%	Rs.50,000/- +10%	Rs.70,000/- +10%
Human Resource	1	1	1	2	3
Area Requirement (m2) @15m2 / Pit	120	360	600	1200	2400

- ✓ **An economical Waste to Compost Technology, recommended for area having larger green/ open space (rural area) or resident/ institution with green space:**

Option # 4:

- d) **Bin/ Drum Composting:** Here the waste is placed in a bin/ drum having tap at bottom for removal of leachate that is formed at bottom of the container. A Bin compost is more like anaerobic process that takes 45-60days to convert organic waste into garden compost. Recommended only for residence with lawns & small institutions having green cover.

- The waste inputs can be: **Only Vegetarian & Horticulture waste**
- The output can be: Quality Compost
- **Environmental Concern:** Such drum/ bin composting has too little aeration thus, will smell putrid or like rotting eggs and will look slimy, especially green material. Focused management is required. Leachate also generate but can be managed, using it as insecticide or germicide and also a conditioner for soil.



Tentative Costing (Capex & Opex) of the product is as under:

Particulars for Vermi Composting	100Kgs	300Kgs	500Kgs	1000Kgs	2000Kgs
No. of Bins of 250Ltrs capacity required (acid proof)	8Nos	24Nos	40Nos	80Nos	160Nos
Capex (One time) +/- 10%	Rs.13,000/-	Rs.39,000/-	Rs.65,000/-	Rs.1,30,000/-	Rs.2,60,000/-
Suitable for families +/- 10%	200Nos.	600Nos.	1000Nos.	2000Nos.	4000Nos.
O&M Expense (Rs./ Mth.) Include 3M resource +/- 15%	Rs.48,000/-	Rs.120,000/-	Rs.180,000/-	Rs.216,000/-	Rs.264,000/-
Human Resource +/- 5%	4	10	15	18	22
Area Requirement (m2) @6m2 / Bin	50	150	250	500	1000



5. Waste generation scenario

Sr.	Parameters	Value	Unit
1.	Estimated Waste Generation from unorganized residential, market & Commercial Area of Noida	500	TPD
2.	Estimated Organic Waste Generated by the Bulk Waste Generators in Noida (large gated community, RWAs, AoAs, Hotel, Institutions, Commercial Houses, hospitals, market associations, tech parks etc.) Approx. 30%	150	TPD
3.	Total Horticultural Waste from Noida Jurisdictional Area (Dept. handle)	25	TPD
4.	Total Wet Waste Considered for Design	175.0	TPD

The wet waste for the composting process is considered to be 150.0TPD. Apart from the wet waste generated from households, there are around 326 parks which contribute to the biodegradable waste. The waste generation from the horticulture waste is calculated as under:

Plan for Horticulture Waste							
Sr.	Sector	Total no of parks	Park Area (in Acres)	Area in M2	Approximation Used (Kg/m2/Year)	Total Garden Waste Generated (Kgs/Year)	Total Garden Waste Generated (Ton/Day)
1	Sector 1	1	2.42	9791	1.5	14687	0.05
2	Sector 2	2	1.61	6514	1.5	9771	0.05
3	Sector 3	2	4.25	17196	1.5	25793	0.08
4	Sector 4	1	2.1	8497	1.5	12745	0.05
5	Sector 5	1	1.57	6352	1.5	9528	0.05
6	Sector 6	7	6.3	25490	1.5	38235	0.50
7	Sector 7	4	3.19	12907	1.5	19360	0.06
8	Sector 8	1	10.57	42766	1.5	64149	0.20
9	Sector 9	8	3.21	12988	1.5	19481	0.06
10	Sector 10	2	1.73	7000	1.5	10499	0.05
11	Sector 11	9	3.65	14768	1.5	22152	0.07
12	Sector 12	35	13.21	53448	1.5	80171	0.25
13	Sector 13	5	3.13	12664	1.5	18996	0.06
14	Sector 14A	5	3.79	15334	1.5	23002	0.07
15	Sector 15	15	4.63	18733	1.5	28099	0.08
16	Sector 15A	10	9.78	39570	1.5	59355	0.12
17	Sector 16	1	0.32	1295	1.5	1942	0.05
18	Sector 17	1	1.64	6635	1.5	9953	0.05
19	Sector 18	4	3.92	15860	1.5	23790	0.07
20	YFR1st	2	39.53	159938	1.5	239908	0.70
21	YRF/95	1	23	93058	1.5	139587	0.40
22	Sector 19	15	10.76	43535	1.5	65302	0.20
23	Sector 20	13	5.95	24074	1.5	36111	0.10

24	Sector 21	9	5.1	20635	1.5	30952	0.10
25	Sector 22	23	6.01	24316	1.5	36475	0.10
26	Sector 23	3	4.82	19502	1.5	29253	0.10
27	Sector 25	7	5.56	22496	1.5	33744	0.10
28	Sector 26	11	9.8	39651	1.5	59476	0.17
29	Sector 27	15	7.79	31518	1.5	47278	0.15
30	Sector 54	3	21.63	87515	1.5	131272	0.38
31	Sector 55	9	14.53	58788	1.5	88183	0.25
32	Sector 56	10	7.84	31721	1.5	47581	0.15
33	Sector 57	4	7.03	28443	1.5	42665	0.15
34	Sector 58	6	8.72	35281	1.5	52922	0.15
35	Sector 62	6	35.49	143593	1.5	215389	0.60
36	Sector 62 RV	11	2.59	10479	1.5	15719	0.05
37	Sector 63	10	36.98	149621	1.5	224432	0.65
38	Sector 63	2	2.69	10884	1.5	16326	0.05
39	Sector 64	2	10.87	43980	1.5	65970	0.20
40	Sector 65	3	14.35	58060	1.5	87090	0.25
41	Sector 66	1	1.42	5745	1.5	8618	0.03
42	Sector 67	3	4.94	19987	1.5	29981	0.09
43	Sector 68	1	2.87	11612	1.5	17418	0.05
44	Sector 69	2	1.39	5624	1.5	8436	0.05
45	Sector 122	10	27.64	111831	1.5	167747	0.50
46	Sector 70	3	7.97	32247	1.5	48370	0.15
47	sector 71	11	12.29	49725	1.5	74588	0.25
48	Sector 72	4	22.51	91075	1.5	136613	0.40
49	Sector 73	1	0.73	2954	1.5	4430	0.05
50	Sector 119	3	9.4	38032	1.5	57049	0.20
51	Sector 120	1	4.5	18207	1.5	27311	0.10
52	Sector 121	1	1.09	4410	1.5	6615	0.09
53	Village Chhijarshi	1	0.15	607	1.5	910	0.05
54	Village Harola	1	0.6	2428	1.5	3641	0.01
55	Community Centre Sec 11	1	0.35	1416	1.5	2124	0.01
56	Village Jhundpura	1	0.09	364	1.5	546	0.02
57	Village Chauda	1	0.21	850	1.5	1274	0.01
58	Village Navada	1	0.41	1659	1.5	2488	0.01
Total Estimated Horticulture / Garden Waste Generation (TPD)							25.00

6. Decentralized Waste Management Protocol:

Following is to be done to ensure that the desired goals is achieved in a time bound manner:

- 1) **Public Notification:** A notification in all national and local dailies need to be released with clear cut direction for ensuring compliance with Solid Waste (Management & Handling) Rules, 2016 and Hon'ble National Green Tribunal to all the Bulk Waste Generators.
- 2) **Identification of Bulk Waste Generators:** A data bank having list of all bulk waste generators need to be prepared and mapped before June 2019, so that individual notices could be served for needful compliances.
- 3) **Cluster Approach:** For ensuring sustainability of the decentralized project, cluster approach covering commercial, institutional, residential, high rise apartments etc can be clubbed which falls in a radius of 250-500Meters, depending upon the area size, technology processing capacity, population density, availability of space for composting plant and easy approach.
- 4) **Dispute Resolution with Door to Door Waste Collection and Transportation Operator:** Many of the RWAs and apartment associations have issues related to paying of service charges to Door to Door Waste Collection & Transportation operator. The association major concern is that they already have their internal arrangements of waste collection, segregation, management and disposal in place on which they are spending substantial amount and they are getting quality and satisfied services, then why additional burden is placed on the generators to pay fee twice for waste management. This concern need to be addressed by allowing Bulk Waste Generators to manage their waste internally. If RWA or any bulk waste generator is not disposing any of its waste outside its premise, then they should be allowed not to pay any charges to Noida's authorized C&T operator. In such a case RWA or the Bulk waste generators need to produce a MoU's copy that they have entered with the Private agency to handle their entire waste in-house/ within its premise.
- 5) Bulk waste generators should be given target date for compliance and in case of non-compliance appropriate actions should be taken against them as per provisions in the SWM 2016.
- 6) Proper inspection team should be deployed for periodic checking the compliance status with the bulk waste generators. Also, strictly stop collection and disposal of waste from bulk waste generators. The penalty must be applicable for each violation of SWM 2016.
- 7) Applicable penalty and methodology of collection of penalty should be well documented and all bulk waste generators must be informed about the same in the notice for compliance; served to them.
- 8) Identify and appoint authorized waste recyclers for dry waste, e-waste and fix item-wise procurement price for them.
- 9) Issue Public notice informing the general public about authorized recyclers and the procurement rates.
- 10) Direct all bulk waste generators to handover dry waste to authorized recyclers only.
- 11) Direct all bulk waste generators, RWAs, AOA's, institutions not to handover waste (dry/wet) to organizations claiming to be waste processors. If any of these bulk waste generators were found handing over waste to these type of organizations, the applicable penalty as per the notification may be imposed on them.
- 12) Street Vendors, Market Associations, unrecognized markets, residents of villages and other semi-rural areas should be encouraged to use two bins systems and VATs wherever

- possible. D2D collection team should be directed to put priority on managing these wastes.
- 13) A project management cell should be formed with a helpline facility, mobile app, project control room and other necessary resources. This cell will be primarily responsible for day to day project monitoring tasks.
 - 14) The project management team should also be made responsible for tracking violators of SWM 2016 and these protocol, their penal actions and maintain data base of all bulk waste generators.
 - 15) For long term results, seminars, road shows, nukkar-nataks on segregation and scientific waste management should be regularly organized in schools, colleges, RWAs, AOA's on regular basis. A separate team should be appointed specifically for these activities with predetermined targets.
 - 16) Educational Institutes should be encouraged to organize competitions, debates, group discussions among students on scientific waste management and 'certificate of appreciations' may be issued to participants.
 - 17) All Movie halls should be requested to run a 15 seconds slide on scientific waste management before each show. The slide should contain the helpline no. for any further assistance.
 - 18) Social media campaign should be organized through WhatsApp groups, Facebook, Instagram, weekly SMS etc. to create awareness and involve more and more citizens in the scientific waste management program.
 - 19) RWAs/ AOA's, commercial bulk waste generators, institutions, should be incentivized and encouraged to undertake proper segregation and scientific waste management practices. e.g. 1) Kolkata Corporation is offering 10% rebate in house tax for colonies/ AOA's engaged in segregation and scientific waste management. 2) Gurugram Municipal Corporation is contemplating offering higher FARs to builders for ensuring zero waste property.
 - 20) "No-completion certificate" should be issued to the builders unless they ensure scientific waste management in their projects. The projects who had already received Completion Certificate, should strictly advised to undertake waste management practices else Completion Certificate may be temporarily withdrawn.
 - 21) More corporates should be approached for CSR funding to fund these activities.
 - 22) NGOs should be pitched in rural areas to educate the public and help them to get benefited with the compliances.
 - 23) The RWA will place supply order directly to the technology operator along with their 5% share on the above indicated price and the copy of the same will be submitted to Director Horticulture for releasing 95% of their share to the RWA. RWA will enter into a MoU with the technology supplier for a period of minimum 10years.
 - 24) CEO, Noida Authority will act as an Arbitrator in case any dispute arises. The decision of CEO shall be final and abided by either party.
 - 25) Noida Authority will also provide a suitable site near to RWA for setting up the decentralized waste treatment facility.
 - 26) Public Health Department of the Noida will ensure that no dispute should arise between Door to door contractor and the facility operator providing decentralized waste management solution to RWA in compliance with the SWM Rules, 2016.
 - 27) The RWAs who are having 100% in house management of their entire solid waste need to furnish an affidavit to Public Health Department of Noida Authority ensuring 100% compliance with the SWM Rules, 2016. On receipt of this the RWAs shall be excused from

paying any user charges to D2D waste collection authorized contractor. In such case, RWA have to ensure that their no waste should be either dumped at Dhalow Ghars/ transfer stations/ community bins. Construction and Demolition debris can be placed outside the premise which shall be catered separately by the C&D waste management and disposal contractor.

7. Cluster approach

To make the decentralized waste management model financially viable and sustainable it's important to plan the facility on cluster approach model. Few of the proposed cluster is detailed under. Horticulture department need to identify suitable site where these technologies can be installed.

The below cluster formation are just tentative and can be altered suiting to RWAs requirement and subject to site availability, geographical approach and financial contribution etc. Horticulture Department need to address the cluster model to minimize the financial load on Authority in delivering the technology on subsidized rates. This cluster is based on the survey undertaken by Adarsh Seva Samiti, NGO engaged by Authority for undertaking various sanitation and waste management related activities in Noida.

Cluster Model					
Sr.	Circle	Code	RWA/BWG	Proposed Capacity of Cluster (TPD)	Area of cluster (sq km)
1	2		28,29 & 37	3	1.23
2	2		21 & 25	2	0.59
3	5		33 & 34	5	1.00
4	5		52 & 53	5	1.19
5	2		26 & 27	2	0.92
6	2		17 & 17 A	1	0.22
7	3		39, 40 & 41	2	1.72
8	3		43,44 & 45	5	3.59
9	3		49,50 & 51	5	4.46
10	1		11 & 12	5	1.18
11	1		55 & 56	2	0.95
12	3		46,47,48,99,100 & 42	5	3.57
13	8		104,107,105 & 108	5	4.03
14	8		82 & 110	5	1.59
15	8		92,93,93 A & 93 B	5	2.11
16	8		136 & 137	5	1.45
17	9		134,135 & 130	1	2.12
18	6		70 ,71 & 121	5	2.72
19	6		72,73,119,120 & 122	5	3.79
20	6		74,75,76,77,116,117,115 & 118	5	1.34
21	6		78,79,112 & 113	5	2.28
22	5		22 & 23	5	0.91
23	4		62	5	4.17
24	2		19&20	5	0.89
TOTAL CAPACITY OF ALL CLUSTERS				98	

8. Deadline set to achieve compliance with SWM Rules, 2016.

Sr.	Particulars	Deadline for Compliance
1)	All RWAs/ Apartment Associations/ High rise residential apartments/ building under Bulk Waste Generating Category	31 st December 2019
2)	All Hotels, Institutions, & Commercial Establishments under Bulk Waste Generating Category	31 st October 2019
3)	Bulk Waste Generators, apart from the above two listed categories	31 st March 2020

Note: After the lapse of above deadlines, Authority will stop lifting the garbage from the Bulk Waste generators and will initiate penal action in compliance with the laid provisions under the SWM Rules, 2016 and National Green Tribunal's Direction.

9. Proposed Panel Actions against the defaulters:

Following panel action shall be initiated on every non-compliance observed at Waste Generator level in compliance with SWM Rules, 2016 on every act of offence.

Sr.	Rule/ Bye Laws no.	Offences	Applicable to	Fine for every default (in Rupees)
1	Rule 4(1)(a) of SWM Rules	Failure to segregate and store waste and handover segregated waste in accordance with the rules	Residential	200
			Marriage/ Party Halls, festival halls, Party Lawns, Exhibition and fairs with area less than 5,000SqM	10,000
			Clubs, Cinema halls, Pubs, Community Halls, Multiplexes and other such places with area less than 5,000SqM	5,000
			Other non-residential entities with area less than 5000SqM	500
2.	Rule 4(1)(b) and (d) of SWM Rules	Failure to deal with sanitary waste in accordance with the rule Failure to deal with horticulture waste and garden waste in accordance with the rule	Residential	200
			Non- residential	500
3.			Residential	1,000

	Rule 4(1)(c) of SWM rules	Failure to deal with construction and demolition waste in accordance with the rule	Non-residential	5,000
4.	Rule 4(2) of SWM rules	Open burning of solid waste	Violator	5,000
5.	Rule 4(4) of SWM rules	Organizing an event or gathering of more than one hundred person at unlicensed place without following the prescribed procedure	Person(s), who has/ve organized such event or gathering or, on whose behalf such event or gathering has been organized and the event manager(s), if any, who has/ve organized such event or gathering	10,000
6.	Rule 4(5) of SWM rules	Street vendor failing to deal with waste in accordance with the rule	Violator	200
7.	Bye-Law 13(1) read the Rule 15(g) of SWM rules	Littering	Offender	500
Fine shall be levied only once in a month for the following violations				
8.	Rule 4(6) of SWM rules	Failure to deal with waste in accordance with the rule	Resident Welfare Association	10,000
			Market Association	20,000
9.	Rule 4(7) of SWM rules	Failure to deal with waste in accordance with the rule	Gated community	10,000
			Institution	20,000

10.	Rule 4(8) of SWM rules		Failure to deal with waste in accordance with the rule	Hotel	50,000
				Restaurant	20,000
11.	Rule 17(2) of SWM rules		Selling or marketing of disposable products without a system of collecting back the packaging waste generated due to their production	Manufacturer and/or Brand owner	1,00,000
12.	Rule 17(3) of SWM rules		Failure to take measure in accordance with the rule	Manufacturer and/or Brand owner and/or marketing companies	50,000
13.	Rule 18 of SWM rules	Failure to replace fuel requirement by refuse derived fuel	Industrial Unit	1,00,000	

10. Penalties imposed by few other ULBs in compliance with SWM Rules, 2016:

10.1 Bangalore Municipal Corporation

City/ Municipality	Penalty
Bangalore	100 INR for households and 500 INR for bulk and commercial waste 500 INR for households and 1000 INR for bulk and commercial waste on repetition

10.2 Municipal Corporation of Delhi

Sr.	Rule/ Bye Laws no.	Offences	Applicable to	Fine for every default (in Rupees)
1	Rule 4(1)(a) of SWM Rules	Failure to segregate and store waste and handover segregated waste in accordance with the rules	Residential	200
			Marriage/Party Halls, festival halls, Party Lawns, Exhibition and fairs with area less than 5,000SqM	10,000
			Clubs, Cinema halls, Pubs, Community Halls, Multiplexes and other such places with area less than 5,000SqM	5,000
			Other non-residential entities with area less than 5000SqM	500
2.	Rule 4(1)(b) and (d) of SWM Rules	Failure to deal with sanitary waste in accordance with the rule Failure to deal	Residential	200
			Non- residential	500

		with horticulture waste and garden waste in accordance with the rule		
3.	Rule 4(1)(c) of SWM rules	Failure to deal with construction and demolition waste in accordance with the rule	Residential	1,000
			Non-residential	5,000
4.	Rule 4(2) of SWM rules	Open burning of solid waste	Violator	5,000
5.	Rule 4(4) of SWM rules	Organizing an event or gathering of more than one hundred person at unlicensed place without following the prescribed procedure	Person(s), who has/ve organized such event or gathering or, on whose behalf such event or gathering has been organized and the event manager(s), if any, who has/ve organized such event or gathering	10,000
6.	Rule 4(5) of SWM rules	Street vendor failing to deal with waste in accordance with the rule	Violator	200
7.	Bye-Law 13(1) read the Rule 15(g) of SWM rules	Littering	Offender	500
Fine shall be levied only once in a month for the following violations				
8.	Rule 4(6) of SWM rules	Failure to deal with waste in accordance with the rule	Resident Welfare Association	10,000
			Market Association	20,000
9.	Rule 4(7) of SWM rules	Failure to deal with waste in accordance with the rule	Gated community	10,000
			Institution	20,000

10.	Rule 4(8) of SWM rules	Failure to deal with waste in accordance with the rule	Hotel	50,000
			Restaurant	20,000
11.	Rule 17(2) of SWM rules	Selling or marketing of disposable products without a system of collecting back the packaging waste generated due to their production	Manufacturer and/or Brand owner	1,00,000
12.	Rule 17(3) of SWM rules	Failure to take measure in accordance with the rule	Manufacturer and/or Brand owner and/or marketing companies	50,000
13.	Rule 18 of SWM rules	Failure to replace fuel requirement by refuse derived fuel	Industrial Unit	1,00,000

10.3 Pune

<https://timesofindia.indiatimes.com/city/pune/hefty-fines-for-housing-societies-hotels-not-processing-wet-waste/articleshowprint/67249234.cms>

10.4 Indore

<https://timesofindia.indiatimes.com/city/indore/penalty-for-non-segregation-of-waste-imc-mandates-residents-to-segregate-waste-or-pay-rs1k-fine/articleshow/65095480.cms>

10.5 Bhopal

<http://www.bhopalmunicipal.com/upload/file/Bye-Laws7.pdf>

11. Financial grants & support:

a) Noida Authority

As of now, probably Noida Authority is only Government body in the entire country, who are providing subsidies to its residents through respective RWAs for scientific waste management practices. But unfortunately, many of them did not come forward because of operations and maintenance cost. It is thus, recommended that after the lapse of deadline no subsidy to beneficiaries be provided. Waste Generators would have to arrange waste processing solutions on their own cost.

Currently Noida Authority is subsidizing 75% of the cost of the plant. Another 20% of the cost of plant is available through CSR funds from different corporate entities. So, RWA is supposed to bear only 5% of the cost of plant and the cost of site preparation. At present, this subsidy is offered only to the RWAs. For rest of the waste generators such subsidy is not offered.

All the stake holders should be advised to create a corpus for one-time payment towards compost plant and preparation of the proposed site. Subsequently the service provider may be allowed to collect the usage/ processing fees from the stake holders on monthly basis and the output produced by the plant which can be sold in the market to cover the operations and maintenance expenses. This method will help maintaining a sustainable wet waste management project.

b) Corporate Social Responsibility:

As this initiative is under Swatch Bharat Mission, a prestigious project of Government of India, Corporates may be approached for providing CSR fund for the following activities:

- 1) Towards partial cost of procurement of Plant
- 2) Towards funding the activities for creating awareness on Scientific waste management
- 3) Towards funding the seminars, debates, road shows, social media marketing etc. to involve more and more citizens in the program.
- 4) Towards purchasing the outputs of plant at a decent rate to help encourage sustainable models.
- 5) IT needs to be ensured that CSR funding should be available regularly to continue the program.

c) Beneficiaries Contribution:

It is very unfortunate that most of the beneficiaries think that the responsibility of segregation and waste management are limited to only government authority. Little do they realize that all these activities are aimed for a better life for themselves and their future generations. That's why it is suggested that sustained awareness programs and strict adherence to compliance are required to derive benefit from this program. Community leaders, RWA officials and think tanks should be involved to achieve the best results.

The beneficiaries should start with segregation at source with immediate effect and be ready to pay the user/ processing fee – a very nominal amount per month to help running this program.

The beneficiaries should be given proper guidance on segregation and usage of two bin system to start with.

Workshops may be organized to educate the beneficiaries on segregation and waste management to achieve better results in the coming years.

d) Operators Contribution:

It is observed that many operators start approaching the Authority for their inclusion in the waste management program. It is suggested that only professionally managed operators with sound technical knowledge on waste management and interested in long term engagement should be considered as product and service providing partner for the scientific waste management program.

Operators should be technically competent and able to run self-sustainable models should be considered to become partner to this program. Since waste management in India is evolving as a subject, the Operators must be willing to provide the latest technology backed by proper service. Operators should be willing to operate at a low/ reasonable margin and help achieving the objective behind this program.

12. List of Bulk Waste Generators and estimated capacity of plant to be placed for ensuring the compliance with SWM Rules, 2016.

Sr.	Name Of Apartment; Society & RWAs etc	Type of BWG	Address		No. of Units	Expected Waste Generation (MTPD)	Organic Waste Qty. (MTPD)
			Circle	Sector			
1	Gardenia Glory PVT. Management Services	AoA	3	Sec-46	1600	4.00	2.00
2	SDS NRI Residency	AoA	3	Sec-45	621	1.55	0.78
3	Lotus panache Sec- 110	AoA	8	Sec-110	1200	3.00	1.50
4	Silver city Apartment	AoA	8	Sec-93	644	1.61	0.81
5	Mahagun Moderne	AoA	6	Sec-78	2633	6.58	3.29
6	Sethi max Royal	AoA	6	Sec-76	726	1.82	0.91
7	Golf city Plot no. 11	AoA	6	sec-75	780	1.95	0.98
8	Antriksh nature Apartment Owner Association	AoA	5	Sec-52	230	0.58	0.29
9	Maxblis white house	AoA	6	Sec-75	400	1.00	0.50
10	Aims Golf Avenue-1	AoA	6	Sec-75	800	2.00	1.00
11	Apex Athena	AoA	6	Sec-75	830	2.08	1.04
12	The Hyde park	AoA	6	Sec-78	2100	5.25	2.63
13	RWA Mahagun Manor ,F-30 Sec-50 Noida	AoA	3	Sec-50	138	0.35	0.17
14	Omax Twin Tower AOA ,F-21 Sec-50, Noida	AoA	3	Sec-50	144	0.36	0.18
15	Amrapali Sapphire Ph-1,AOA	AoA	3	Sec-45	1033	2.58	1.29
16	E home infrastructure ,PVT.LTD (Jwell of Noida)	AoA	6	Sec-75	478	1.20	0.60
17	Stellar Kings Court -RWA	AoA	3	Sec-50	112	0.28	0.14

18	Stellar greens Apartment ,D-6 RWA	AoA	3	Sec-44	92	0.23	0.12
19	ATS Greens -2 ,RWA	AoA	3	Sec-50	300	0.75	0.38
20	Eldeco utopia ,A block	AoA	8	Sec-93 A	710	1.78	0.89
21	Pan Oasis, society Sec-70 Noida	AoA	5	Sec-70	2000	5.00	2.50
22	Gaur Grandeur Apartment, GH - 04 Noida	AoA	6	Sec-119	1018	2.55	1.27
23	R.G. Residency RWA	AoA	6	Sec-120	1500	3.75	1.88
24	Sai apartment, Block -B2	AoA	5	Sec-71	368	0.92	0.46
25	Shiv shakti Apartment (EWS)	AoA	5	Sec-71	1680	4.20	2.10
26	Eldeco Aamantran Sec-119	AoA	6	Sec-119	650	1.63	0.81
27	Amarpali Platinum Apartment owners Association	AoA	6	Sec-119	950	2.38	1.19
28	Kribhco township	Govt.	5	Sec-35	100	0.25	0.13
29	RWA -Sec 40 Noida	RWA	3	Sec-40	700	1.75	0.88
30	Best View Apartment (LIG)	RWA	3	Sec-99	608	1.52	0.76
31	Gulmohar park Sahkari awas samiti (LIG)	RWA	3	Sec-44	64	0.16	0.08
32	AWA Sec-99 Noida	RWA	3	Sec-99	400	1.00	0.50
33	RWA sec-45	RWA	3	Sec-45	400	1.00	0.50
34	HIG - MIG	RWA	3	Sec-99	288	0.72	0.36
35	Prateek stylome GH -04 , Noida	RWA	3	Sec-45	545	1.36	0.68
36	ICPO-ICMR, sahakari awas samiti LTD plot no119	RWA	5	sec-35	102	0.26	0.13
37	Udaygiri-1 ,B-10A/B-12 Noida	RWA	5	Sec-34	528	1.32	0.66
38	Nilgiri-2, C-75	RWA	5	sec-34	64	0.16	0.08

39	Mandeshwari sahkari awas Samiti LTD Kesar Garden Apartment	RWA	3	Sec-48	155	0.39	0.19
40	Udyog vihar	RWA	8	Sec-82	896	2.24	1.12
41	Swarnim vihar association of Residents-HIG	RWA	8	sec-82	128	0.32	0.16
42	Aravali RWA B-1 (Regd.no.359/94-95)	RWA	5	Sec-34	352	0.88	0.44
43	Aravali apartment B-3	RWA	5	Sec-34	352	0.88	0.44
44	Narvihar-1 RWA, B-7	RWA	5	Sec-34	120	0.30	0.15
45	Udaygiri, B-10	RWA	5	sec-34	576	1.44	0.72
46	Dhawalgiri Apartment ,B-5	RWA	5	Sec-34	320	0.80	0.40
47	Udaygiri -2, B-9	RWA	5	sec-34	336	0.84	0.42
48	ECO RWA , Plot no. 4 Sec-93	RWA	8	Sec-93	550	1.38	0.69
49	Kendriya Vihar -2, Plot no.-3	RWA	8	Sec-82	2276	5.69	2.85
50	RWA Sector-92	RWA	8	Sec-92	600	1.50	0.75
51	The Forest RWA Plot no.-A214	RWA	8	Sec-92	105	0.26	0.13
52	Express View Apartment	RWA	8	Sec-93	1008	2.52	1.26
53	RWA Sector-93B	RWA	8	Sec-93B	200	0.50	0.25
54	Madhuban Apartment, MIG Flats, 67-A	RWA	8	Sec-82	240	0.60	0.30
55	Jal vayu vihar	RWA	2	Sec-21	3696	9.24	4.62
56	RWA Sector-20	RWA	2	Sec-20	1600	4.00	2.00
57	Plot holders ,RWA Sector-56	RWA	368	Sec-56	515	1.29	0.64
58	RWA sector-46	RWA	3	Sec-46	450	1.13	0.56
59	RWA Sector-52	RWA	5	Sec-52	737	1.84	0.92
60	Shubhkamna ABH F-31 Sec-50 Noida	RWA	3	Sec-50	135	0.34	0.17
61	Supreme Towers	RWA	3	Sec-99	684	1.71	0.86

62	RWA ,Sec-15 A	RWA	1	Sec-15 A	650	1.63	0.81
63	Rajat Vihar ,C-block	RWA	4	Sec-62	368	0.92	0.46
64	Kailash bham Sahkari awas samiti ,plot no. E-1	RWA	3	Sec-50	402	1.01	0.50
65	Manyawer Kashiram colony	RWA	3	Sec-45	500	1.25	0.63
66	Mansarovar apartment Sec-61, Noida	RWA	5	Sec-61	136	0.34	0.17
67	RWA Sec-30	RWA	2	Sec-30	540	1.35	0.68
68	Dhawalgiri Apartment ,Noida	RWA	1	Sec-11	488	1.22	0.61
69	Ward -1 Sec-28	RWA	2	Sec-28	600	1.50	0.75
70	Ward -2 ,H.no. 159 ,Sec -28	RWA	2	Sec-28	216	0.54	0.27
71	RWA ,Sec51	RWA	3	Sec-51	277	0.69	0.35
72	RWA Sec-104	RWA	8	Sec-104	100	0.25	0.13
73	Centary Apartment MIG	RWA	3	Sec-100	392	0.98	0.49
74	RWA Sec-44	RWA	3	Sec-44	450	1.13	0.56
75	D-1 Aravali Aptment ,Noida	RWA	5	Sec-52	800	2.00	1.00
76	Himgiri RWA ,B-14 Noida	RWA	5	Sec-34	368	0.92	0.46
77	M- block RWA Sec-22 Noida	RWA	5	Sec-22	361	0.90	0.45
78	RWA ,Sec-55 Noida	RWA	1	Sec-55	1400	3.50	1.75
79	Ananda Apartment ,RWA	RWA	3	Sec-48	72	0.18	0.09
80	Jal vayu Tower	RWA	3	Sec-47	383	0.96	0.48
81	Awasia Kalyan samiti , Noida	RWA	2	Sec-19	2800	7.00	3.50
82	Windsor Greens RWA , F-28	RWA	3	Sec-50	164	0.41	0.21
83	Silver Estate, F-29 Noida	RWA	3	Sec-50	105	0.26	0.13
84	Ward , 11A -AV, RWA	RWA	2	Sec-37	128	0.32	0.16
85	RWA sec-41 Noida	RWA	3	Sec-41	1500	3.75	1.88

86	RWA Sec-26	RWA	2	Sec-26	900	2.25	1.13
87	Ward - 18 RWA Noida	RWA	2	Sec-37	209	0.52	0.26
88	Ward -16 ,RWA Noida	RWA	2	Sec-37	154	0.39	0.19
89	ward -17 , RWA Noida	RWA	2	Sec-37	216	0.54	0.27
90	RWA ,Sec-27 Noida	RWA	2	Sec-27	1250	3.13	1.56
91	Ever green RWA ,Sec-12	RWA	1	Sec-12	3500	8.75	4.38
92	RWA sec -43	RWA	3	Sec-43	150	0.38	0.19
93	RWA Sec-108 Noida	RWA	8	Sec-108	881	2.20	1.10
94	RWA sec-28 , Ward 2 ,Noida	RWA	2	Sec-28	114	0.29	0.14
95	Pocket-B ,HIG Flat Sec-105	RWA	8	Sec-105	160	0.40	0.20
96	RWA Sec-39 Noida	RWA	3	Sec-39	600	1.50	0.75
97	RWA sec-31,B-66 Noida	RWA	2	Sec-31	1400	3.50	1.75
98	RWA sec-29 Ward -8, Noida	RWA	2	Sec-29	174	0.44	0.22
99	RWA sec-29 Ward -7, Noida	RWA	2	Sec-29	294	0.74	0.37
100	RWA sec-37 Ward -12A, Noida	RWA	2	Sec-37	471	1.18	0.59
101	RWA sec-37 Ward -12, Noida	RWA	2	Sec-37	264	0.66	0.33
102	RWA Sec-66 Noida	RWA	5	Sec-66	700	1.75	0.88

The total quantity of organic waste material generated by the respective RWAs/ AoAs/ Society per Metric Ton will be the desired decentralized machine's processing capacity. To optimize the cost, it is advisable that cluster within 300-500mtr periphery can be formed seeking mutual consent of respective society/ RWAs/ AoA's president/ secretary.