

**IN THE HON'BLE NATIONAL GREEN TRIBUNAL  
AT NEW DELHI  
Original Application No.606 of 2018**

BETWEEN:

.... PETITIONERS

AND:

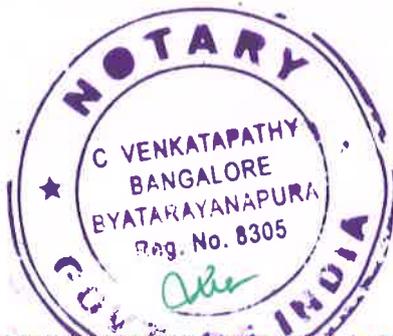
CPCB & OTHERS

.... RESPONDENTS

**AFFIDAVIT FILED BY THE CHIEF SECRETARY TO  
GOVERNMENT OF KARNATAKA - RESPONDENT**

I, P.Ravi Kumar, S/o. P Gopal Reddy aged about 59 years, presently, working as Chief Secretary, Government of Karnataka, Bengaluru do hereby solemnly affirm and State on oath as follows :-

1. I submit that I have been working as Chief Secretary, GOVERNMENT OF KARNATAKA since **January 2021** and in my official capacity and as verifiable from official records maintained with Government of Karnataka, I am familiar with the facts of the case and hence I am swearing this affidavit.
2. I respectfully submit that based on the directions of this Hon'ble Tribunal, I ensured coordination with various Departments of Government of Karnataka and



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based on the information provided by such departments, I depose the present affidavit.

3. I respectfully submit that, directions of the Hon'ble Tribunal with respect to OA No. 606/2018 are being adopted in both Urban and Rural areas of the State.

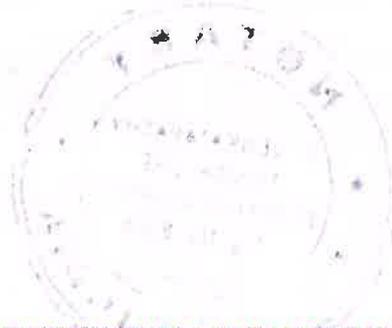
4. I respectfully submit the abstract of implementation status of Solid Waste Management(SWM), Plastic Waste Management (PWM), Biomedical waste Management (BWM) Rules-2016 in 313 Urban Local Bodies (in 6902 wards),5992 Gram Panchayats and 35,869 Health Care facilities along with implementation status of other issues mentioned in Hon'ble NGT order dated:24-4-2019 (page 13 and 14, para 20 [a – h] are detailed below;

**1. Para 20(a):**

I. Compliance to SWM Rules 2016 in **urban areas**(excluding Bengaluru) is enclosed herewith and marked as **Annexure-R1**.

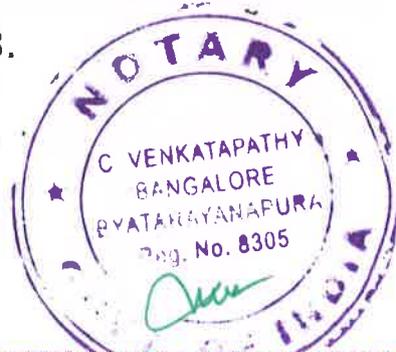
II. Compliance to SWM Rules 2016 in **Bruhat Bangalore Mahanagara Palike(BBMP)** is enclosed herewith and marked as **Annexure-R2**.

III. Compliance to SWM Rules 2016 in **Rural areas** is enclosed herewith and marked as **Annexure-R3**.

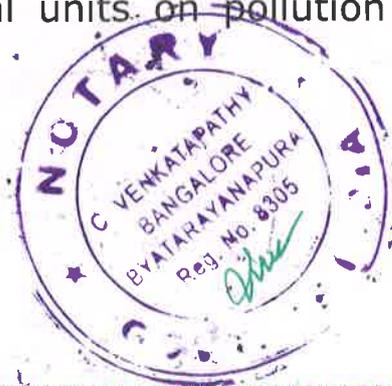


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- IV. Compliance to SWM Rules 2016, BWM Rules 2016, Hazardous and another Wastes (Management and Trans-boundary Movement) Rules 2016, E-Waste Management Rules-2016, status of CETPs/ETPs, air pollution and noise pollution status by **Karnataka State Pollution Control Board** is enclosed here with and marked as **Annexure-R4**.
- V. Compliance to Status of STPs and re-use of treated wastewater by Bangalore Water Supply and Sewage Board (**BWSSB**) and Karnataka Urban Water Supply and Drainage Board (**KUWS&DB** for cities other than Bangalore) is enclosed herewith and marked as **Annexure-R5**.
- VI. Compliance to Rejuvenation of water bodies by Urban Development Department is enclosed herewith and marked as **Annexure-R6**.
- VII. Compliance on illegal sand mining by the Department of Mining and Geology is enclosed herewith and marked as **Annexure-R7**.
- VIII. Compliance to ground water extraction /Contamination and recharge by Directorate of Groundwater is enclosed herewith and marked as **Annexure-R8**.



2. **Para 20(b):** State level/District level NGT SLC meetings were conducted on 5-1-2021, 8-2-2021, 12-2-2021, 20-1-2021 & 20-2-2021. Proceedings of the meetings are made available at <https://kspcb.karnataka.gov.in/proceedings-ngt-slc-meetings>
3. **Para 20(c):** Compliance to Hon'ble NGT order dated 20.09.2018 in the News Item published in "The Hindu" authored by Shri. Jacob Koshy titled "More river stretches are critically polluted (OA No 673/2018) is enclosed herewith and marked as **Annexure-R9**.
4. **Para 20(d):** Compliance to Status of functioning of the Committees constituted in News Item published in "Times of India" Authored by Shri Vishwa Mohan Titled "NCAP with multiple timelines to clear Air in 102 cities released around Aug 15" dated 08.10.2018 is enclosed herewith and marked as **Annexure-R10**.
5. **Para 20(e):** Compliance to Status of Action Plan with regard to identification of polluted industrial clusters in O.A.No.1038/2018, news item published in "The Asian Age" Authored by Sanjay Kaw Titled "CPCB to rank industrial units on pollution levels"



dated 13.12.2018 is enclosed herewith and marked as **Annexure-R11**.

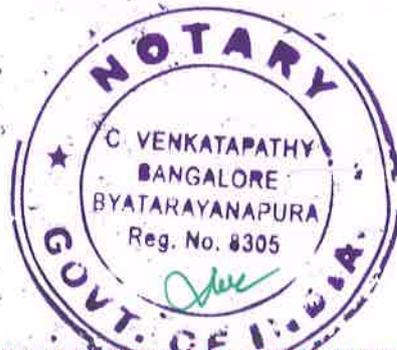
**6. Para 20(h):**

I. Performance of **6 Model towns in Karnataka** is as below,

Model cities SWM Progress											
SL No	ULB Name	ULB Type	Ward No	Door to Door Collection		Source segregation		Waste Processing			Rank
				No of wards with 100% D-D Collection	Progress	No of wards with 100% segregation	Progress	MSW Generated (in TPD)	Waste Processed (in TPD)	Progress	
1	Belagavi	CC	58	58	100%	32	55%	250	250	100%	1
2	Karwar	CMC	31	31	100%	31	100%	35	31	88%	2
3	Mangalore	CC	60	60	100%	27	45%	350	252	72%	3
4	Ullal	CMC	31	31	100%	31	100%	17.5	11	63%	4
5	Huntur	CMC	31	31	100%	22	71%	23	14	61%	5
6	Mysore	CC	65	65	100%	65	100%	450	250	55%	6
7	Raichur	CMC	35	35	100%	25	71%	100	45	45%	7
<b>Total</b>			<b>311</b>	<b>311</b>	<b>100%</b>	<b>233</b>	<b>75%</b>	<b>1225</b>	<b>853</b>	<b>70%</b>	

II. 90 Gram Panchayats have been proposed for developing as model GPs as per the list enclosed herewith and marked as **Annexure-R12**.

7. I respectfully submit that, due to Covid situation all developmental works were stalled for more than 7 months and departments are currently facing financial constraints, it is requested Hon'ble NGT to revisit the timelines.
8. I respectfully submit that, several significant achievements have been made by the State of



Karnataka in the field of solid, plastic and biomedical waste management as detailed below:

**URBAN DEVELOPMENT DEPARTMENT:** 313 Urban Local Bodies (6902 Wards) of Karnataka with **2,36,25,962** population generates approximately **11,085** tonnes of Municipal Solid Waste per day.

- I. I respectfully submit that, comparative analysis of SWM implementation in the State when compared to last personal hearing of Chief Secretary, GOK is detailed below;

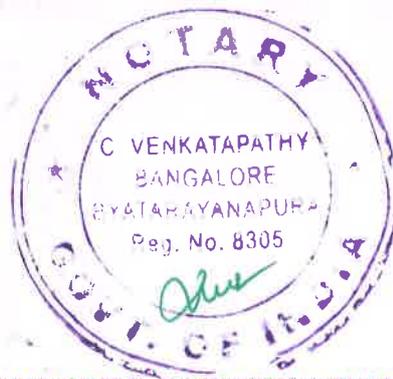
SL no	Item	Status at the time of last personal hearing(20.02.2020)	Present Status (30-6-2021)
1	Door-to-door collection (%)	96%	98%
2	Source segregation of waste (%)	54%	78%
3	Waste Processing (TPD)	42%	61%

- II. I respectfully submit that, State SWM Policy & Strategy is approved on 22-10-2020 copy of the same is enclosed herewith and marked as **Annexure-R13**. Various Non-Governmental Organization and Community Organizations have praised the State policy and strategy as a most inclusive policy.



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- III. I respectfully submit that, BBMP, Mysore, Ramanagara, Periyapatna, Hunsur, H.D.Kote, K.R.Nagar, Kaduru, Holalkere, Jaali (10 ULBs) have bagged awards in Swachh Sarvekshan -2020.
- IV. I respectfully submit that, in order to expedite implementation of SWM, administrative approval powers upto Rs.5.00 Crores has been delegated to Deputy Commissioners and Technical Sanctioning powers up to Rs.5.00 Crores has been delegated to District Level Committee.
- V. I respectfully submit that, permission has been given to ULBs to purchase SWM vehicles directly through GeM Portal.
- VI. I respectfully submit that, Construction & Demolition Waste Management Policy, Strategy and Bye-law are being finalized by the State Government.
- VII. I respectfully submit that, City Sanitation Policies of 180 ULBs are being finalized.



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VIII. I respectfully submit that, in the 2021-22 State budget, 31 nos. of '**Swachhagraha Kalika Kendra**' in all District Head Quarters with an estimated cost of Rs.9.00 Crores has proposed. Detailed Circular about the concept, design criteria, SOP for development & maintenance of '**Swachhagraha Kalika Kendra**' has been given on 7-6-2021. Typical layout of Centre proposed is enclosed herewith and marked as **Annexure-R14**. These Centres will help ULBs in encouraging home composting & community composting in ULBs by acting as strong IEC & Capacity building tool.

IX. I respectfully submit that, in the 2021-22 State Budget, Material Recovery Facilities (MRF) centres in 10 City Corporations with an estimated cost of Rs. 22.00 Crores has been proposed. MRFs will act as aggregation units to generate raw material for recycling, co-processing & other onward journey of dry waste. Necessary instructions in this regard were given to all City Corporations on 7-6-2021.

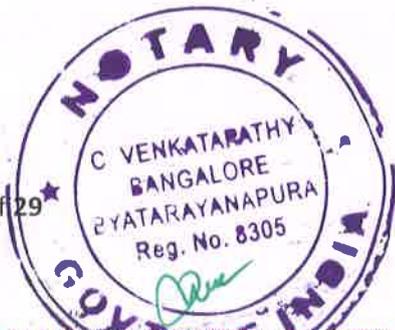
X. I respectfully submit that, in the 2021-22 State Budget, **89 nos. of Community Compost Facilities** in 10 City Corporations (each) and 59



City Municipal Councils (1 each) with an estimated cost of Rs.2.50 Crores under Swachh Bharat Mission (Urban) has been proposed. This will reduce burden on centralised processing facility & ensure community participation in waste management. Detailed instructions have been given in this regard to all City Corporations & City Municipal Councils vide letter dated 28-5-2021. Model MRF & Community Compost proposed in ULBs is enclosed herewith and marked as **Annexure-R15**.

XI. I respectfully submit that, draft C&D Waste Management State Policy & Strategy is enclosed herewith and marked as **Annexure-R16**. Same will be finalised after circulating it with line departments.

XII. I respectfully submit that, 178 Faecal Sludge & Septage Management (FSSM) plants with a capacity to treat 1369 KLD of Septage with an estimated cost of about Rs 350 Crores in non-UGD towns are envisaged in the State as interim measure till UGD system is established in these ULBs. In the first phase of implementation 46 FSSM plants are



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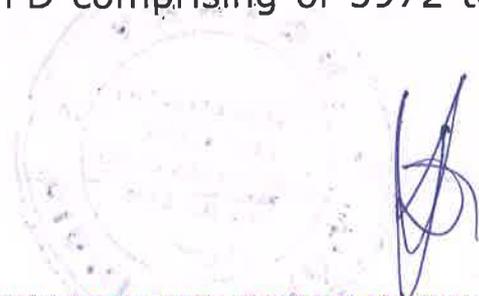
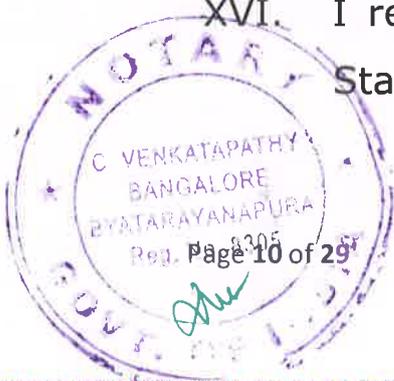
planned, among which 30 FSSM DPRs are ready for approval.

**XIII.** I respectfully submit that, online training is imparted to 77 ULBs about FSSM with the help of USAID. Agreement is signed with Consortium for DEWATS Dissemination Society (CDD) to train 31 TOTs and 300 end trainers in association with **State Institute of Urban Development.**

XIV. I respectfully submit that, as per the directions of Hon'ble NGT training on '**phyto-remediation**' were given to 268 Participants from 42 ULBs located in river stretches through **Environmental Management Policy & Research Institute (EMPRI)** details regarding same is enclosed herewith and marked as **Annexure-R17.**

XV. I respectfully submit that, out of total no. of 6902 wards, **6764 (98%)**wards have achieved 100% Door to Door waste collection, **5395 (78%)**wards have achieved 100% source segregation.

XVI. I respectfully submit that, waste generation in the State is about 11,085 TPD comprising of 5972 tons



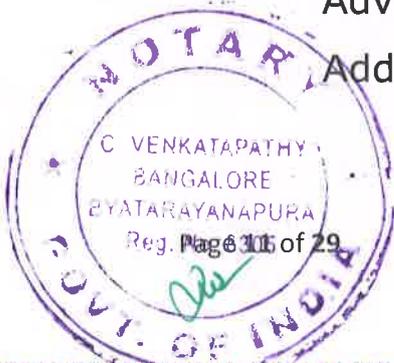
of wet waste, 3782 tons of dry waste, 77 tons of sanitary waste, 1254 tons of street sweeping waste out of which 10,662 tons of MSW is being collected every day.

XVII. I respectfully submit that, 5876 tons of waste is processed generating 672 tonnes of city compost and 158.16 cum bio gas is generated. Efforts are being taken to sell city compost through State Agricultural Department.

XVIII. I respectfully submit that so far, 514 tons of dry waste is recycled per day, 427 tons is converted into RDF/baled, 2.4 tons of plastic waste used in construction of roads, 1178 tons of waste is disposed through co-processing in cement kilns.

XIX. I respectfully submit that, as per the Rules 24 of SWM Rules 2016 annual reports have been submitted to Karnataka State Pollution Control Board.

XX. I respectfully submit that, 2 SWM State Level Advisory Body meetings under the Chairmanship of Additional Chief Secretary, UDD was held on 25-9-



2020 and 12-3-2021 to assess the SWM implementation status. Proceedings of same is enclosed herewith and marked as **Annexure-R18**.

XXI. I respectfully submit that, technical feasibility reports of legacy waste management are prepared in 26 cities with above 1 lakh population. As per the data, a 1.5Cr tonne of legacy waste is existing in the State. Eleven (11) ULBs have prepared DPRs for bio-remediation.

XXII. I respectfully submit that, all ULBs have been instructed to take measures to quantify the legacy waste and take up bio remediation activity as per CPCB guidelines. Permission is given on 6-5-2021 to use of 15<sup>th</sup> Finance Commission grants (up-to 50%) towards legacy waste management with immediate effect. Video Conference training was conducted on 17.06.2021 to all ULBs where officials of CPCB, MOH&UA and service providers of legacy waste management participated.

XXIII. I respectfully submit that, Rs. 18.27 Crs is released towards IEC activities under Swachh Bharat Mission with an aim to raise awareness among public about



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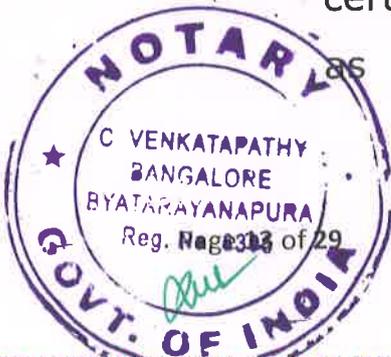
source segregation and responsible public behaviour in having sound environment.

XXIV. I respectfully submit that, the State Level Special Task Force under the Chairmanship of Chief Secretary to eliminate use of single use plastic has been constituted on 24-5-2021. Copy of same is enclosed herewith and marked as **Annexure-R19**.

XXV. I respectfully submit that, State has issued rejoinder on 9-6-2021 with regard to penalty that needs to be levied against defaulter of plastic ban. Proposed fine details are attached herewith and marked as **Annexure-R20**.

XXVI. I respectfully submit that, it is planned to establish two Waste to Energy plants to handle 800 tons of non recyclable combustible dry waste in the State. One W2E plant with 600 TPD capacity is jointly being developed by **BBMP** & Karnataka Power Corporation Limited (**KPCL**) and it is envisaged to set up another W2E plant (200 tpd) jointly by HDMC & NTPC.

XXVII. I respectfully submit that, 270 cities have been certified as ODF cities, 106 ULBs have been certified as ODF+ and 2 ULBs as ODF++ by third party



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agency appointed by Ministry of Housing & Urban Affairs, GOI.

XXVIII. I respectfully submit that, about Rs. 110 Crs of SWM service charges/cess & Rs 3.64 Crs of fines have been collected from the defaulters of SWM Bye-law and Rs 85.11 Lakhs fine levied against the plastic ban in the State.

XXIX. I respectfully submit that, Environmental Monitoring Cell is established and functioning in State since 24-6-2020.

XXX. I respectfully submit that, the details of Best Practices in community composting practiced by Davanagere City Corporation, Madhugiri TMC, KumtaTMC, Chikkaballapura CMC, Ullal CMC, Kadur TMC, Mangalore City Corporation, KR Pete TMC, Huvinahadagali TMC and Ramanagara CMC, have been circulated to all ULBs and Copy of the reports along with photographs are attached herewith and marked as **Annexure-R21**.

XXXI. I respectfully submit that, 20 review meetings have been held in the last year at the State level to review and monitor implementation of SWM Rules-2016.

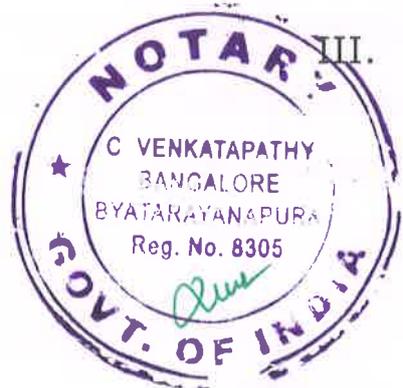


**BRUHATH BENGALURU MAHANAGARAPALIKE  
(BBMP):-**

I. Following the Hon'ble High Court's directive on the removal of flex banners and hoardings in the City of Bangalore, BBMP Council on 06-08-2018 passed a resolution banning flexes, banners and buntings, illegal advertisement hoardings, wall-writing and posters for one year across all its 198 wards. The ban was approved keeping mind the illegal flex and banner menace leading to increasing number of road accidents due to motorists' distraction and impact on visual aesthetics of public spaces.

II. BBMP has established seven (07) MSW processing plants at a cost of Rs.440 crore with funding from Government of Karnataka. These 7 plants have a design capacity to handle 2300 MT of mixed waste per day. However, these plants are now receiving only segregated wet waste with an effective wet waste handling capacity of 1,530 MT per day. Over 26,000 MT of compost is generated annually from these plants.

III. The landfills at Bagalur and Mittaganahalli have been scientifically capped and these capped areas have been developed into garden landscapes. As part of the ongoing environmental monitoring



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measures, passive gas venting and leachate monitoring wells have been provided for, both the sites have been inspected by officials of PCB, SLC of NGT and other monitoring authorities and have been appreciated.

IV. BBMP has two Leachate Treatment Plants (LTPs) at Doddabidarakallu Waste Processing Plant and Bellahalli Landfill with a combined capacity of 150 KLD. The LTP at Bellahalli uses state of the art zero liquid discharge technology to convert landfill leachate into clean water using boom tube resonator based technology. Recently, the technology was recognised as one of top 30 case studies in the special edition of Smart Water and Waste World Magazine.

V. Of the total of about 28,000 MT of REFUSED DERIVED FUEL (RDF) that has been produced till date, 26,500 MT of RDF has been transported for use as an alternate fuel in cement factories. The cost of transportation was borne by the Cement factories out of their CSR fund.

VI. In order to remove dust from kerbsides and medians along 1,400 km of Major Roads (Arterial and Sub-Arterial Roads), BBMP has procured 8 truck mounted mechanical sweepers and 1 ride-

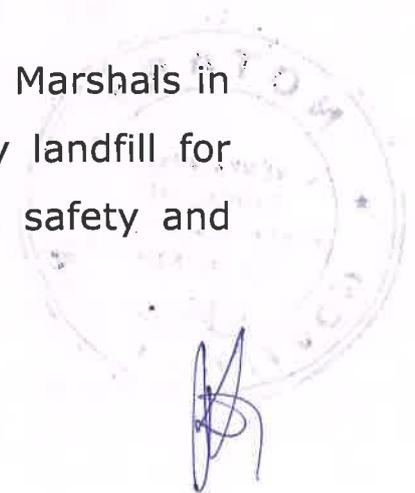
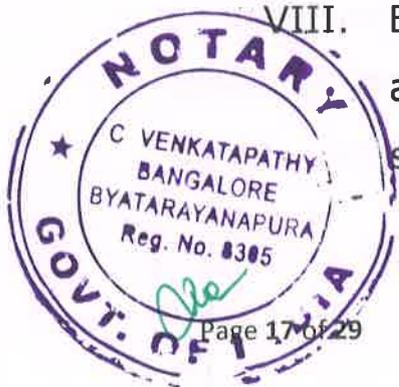


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on mechanical sweeper. These have been deployed on BBMP roads for the past 2 years now. To enhance the effectiveness and coverage, in addition to existing numbers, another 17 mechanical sweepers have been purchased by the City Corporation. To further augment this fleet, it is proposed to hire 17 more mechanical sweepers on rental basis thus ensuring that the entire stretch of major roads are swept mechanically on a periodic basis.

VII. Bengaluru has invested Rs.76 crore for setting up 50 Mini Transfer Stations to shift the solid waste from Tippers to Compactors in a closed facility rather than in the open. These are now in the implementation phase. Once completed, these Mini Transfer Stations will aid in optimising the primary collection efficiencies at the ward level and also help reduce the cost of secondary transportation through reduced no. of trips to the processing facilities and landfill. This will also benefit in terms of reduced air pollution load caused due to vehicular movements.

VIII. BBMP has deployed Ex-servicemen as Marshals in all its processing plants and sanitary landfill for strict monitoring and also to ensure safety and



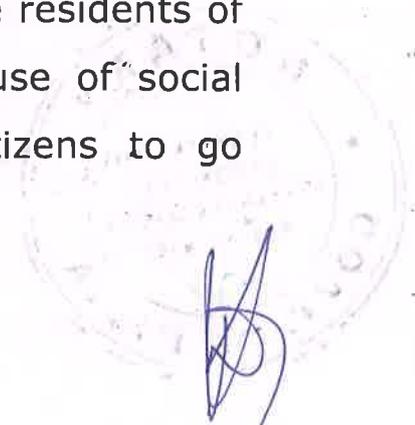
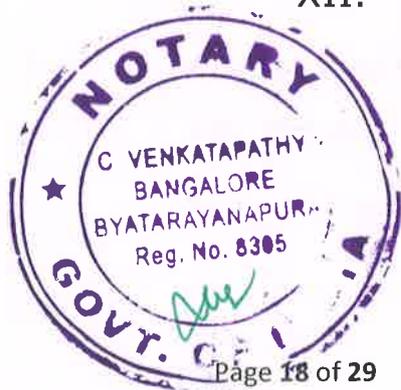
security of the facilities. Marshalls are also deployed in wards of BBMP for ensuring segregation at source and compliance to SWM Rules, 2016 and also for imposing penalty on defaulting citizens. So far the Ex-servicemen Marshals have seized 1,978 Vehicles and checked 2,259 people and penalised Rs. 2,71,010 for unauthorised dumping of waste.

IX. 164 Dry Waste Collection Centres (DWCCs) are established and functional in BBMP and about 130 tons per day of recyclable materials is sold to recyclers.

X. BBMP takes pride in the great citizen engagement initiatives which has helped to achieve many firsts for the city.

XI. With its efforts to promote composting and offer various composting alternatives available in the market, BBMP in association with Civil Society, has set up a Swachhagraha Kalika Kendra (Composting Learning Centre) at a park in HSR Layout as a pilot.

XII. The drive against single use plastic gained momentum in October 2018 with the residents of Bengaluru through the innovative use of social media to spread and motivate citizens to go

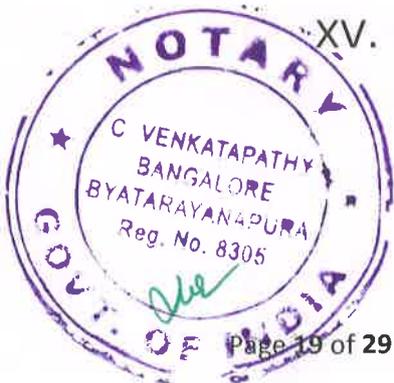


plastic less and carry their own reusable containers and cutlery. Termed as the Bring Your Own Cup (BYOC) challenge, it calls for residents to carry their own reusable steel glasses, plates, containers, spoons instead of using paper / plastic cutlery given by the food vendors and post pictures of themselves with their steel cups on social media with BYOC.

XIII. Installation of lane composters for managing wet waste at street level itself has been done. This has positively impacted the amount of wet waste going out of the ward.

XIV. Spot fixing efforts aim to involve the citizens to go ahead and engage with the BBMP in eliminating and transforming a Garbage Vulnerable Point into a usable public space. The anonymous group calling themselves "The Ugly Indians" are Visual Cleanliness partners in this regard with BBMP. Several solid waste black-spots and Metro Pillars and Stations and BBMP flyovers and underpasses have been transformed thorough these initiatives.

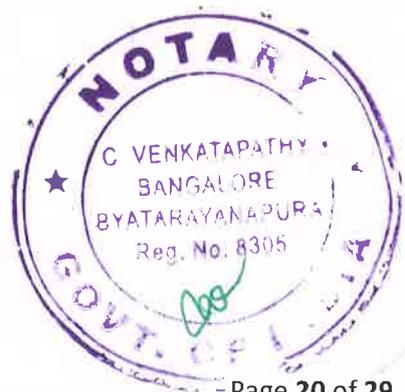
XV. Biometric attendance of over 15,500 Pourakarmikas (PKs) involved in street sweeping and door to door collection has been implemented



for over a year now and the salaries to these PKs has been effected through direct payment system based on the biometric attendance reports.

XVI. Bengaluru handles its quantum of waste through a huge fleet of 4000+ Primary Collection Vehicles (PCV) and 500+ Secondary Transportation Vehicles (STV). The PCVs and STVs are installed with Radio Frequency Identification (RFID) tags. RFID technology intervention has helped SWM Cell, BBMP to track the attendance of the large fleet of PCVs at mustering points and STVs at transfer locations and at processing and disposal destinations. This not only helps in monitoring vehicles movement on a daily basis but also creates a digital record for processing of performance linked payments to service providers.

XVII. Smart Data Centre is being setup for integrating all ICT based SWM data of BBMP with respect to fleet management, weighment, visual monitoring, manpower attendance, segregation and coverage and citizen feedback. The real time tracking would be through RFID / GPS and other relevant technologies. This Smart Data Centre software would then be utilised by other Urban. Local



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Bodies in Karnataka to track their SWM fleet by logging in to this centralised server located at BBMP Head Office. Hence this would be a State Level Smart Data Centre for SWM.

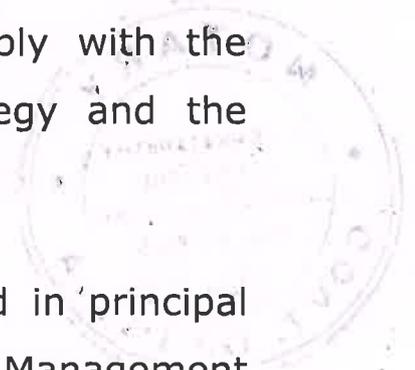
### **RURAL DRINKING WATER and SANITATION DEPARTMENT (RDW & SD):-**

Key achievements /major steps taken up by the Rural Drinking Water and Sanitation Department till 13th July, 2021.

I. The Karnataka State Rural Sanitation and Waste Management Policy, Strategy & Model Byelaws on SWM and LWM were approved by Cabinet and GO was issued for Policy and Strategy on 12th March, 2020 and Byelaws have been published in Gazetteer on 28th May 2020.

II. The model bye-laws to be adopted by the Gram Panchayats (GPs) will act as the enforcement mechanism so that rural local bodies can impose penalties to those who do not comply with the principles laid down in Policy, Strategy and the model bye-laws.

III. The Department has already accorded in principal approval to take up Solid Waste Management



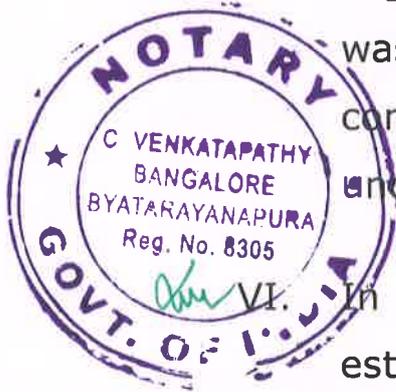
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activities in all Gram Panchayaths in Karnataka vide GO No: RDWS&SD/126/SBM-G/Proj.M/2019, dated: 14-10-2019. Out of 5992 GPs, 4829 GPs SWM DPRs approved as per SBM- G Phase I and Phase II guidelines.

IV. The Department has accorded approval for the remaining 2545 GPs and funds of Rs. 74.01 Crores have been released to districts to take up Solid Waste Management activities in all Gram Panchayaths in Karnataka vide GO No: RDWS&SD/03/SBM-G/PH-II/SWM/2021,dt:15-01-21 as per SWM Rules – 2016.

V. Out of 5992GPs, Detailed Project Reports (DPR) to set up Solid Waste management (SWM) units at 4829 GPs are approved, out of which 2054 units are operational. Segregation and separation of waste at source as dry and wet waste, collection of segregated waste, transportation of segregated waste to processing unit, recycling of dry waste and conversion of wet waste into manure are being undertaken.

VI. In few GPs, are facing land constraints for establishment and implementation of SWM Unit. It



is planned to establish common SWM Unit for cluster of GPs. A Memorandum of Understanding (MoU) is finalized in consultation with CEOs, technical Experts and Legal experts.

VII. Memorandum Of Understanding (MoUs) templates have been finalized and shared with Districts for:

- Multi Gram Panchayat Solid Waste Management Unit
- Utilizing Municipal Solid Waste Management facilities existing in ULBs.

VIII. A unique branding logo "**Swachh Sankeerna**" for Solid Waste management has been launched on October 2nd 2020 to create awareness about sanitation and hygienic among rural areas of Karnataka.

IX. Technical assistance is being provided to Endowment Department for management of solid waste across all the temples.

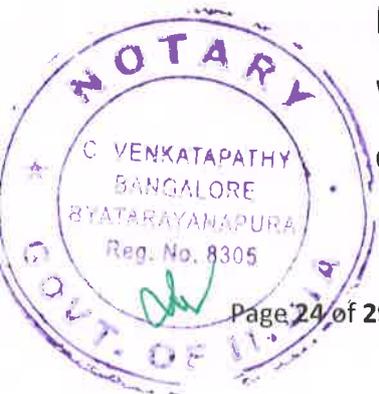
X. Rural Drinking Water and Sanitation Department has taken initiative for safe disposal of sanitary waste as a part of Solid Waste Management under Swachh Bharat Mission objective by facilitating installation of sanitary napkin disposal incinerators as pilot projects in few hostels and Gram



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Panchayats.

- XI. Various IEC activities are conducted across rural Karnataka to promote safe and hygiene practices, to control entry of waste into drains, not to litter and segregation of waste as per the guidelines of Swachh Bharat Mission(Gramin)
- XII. Rural Drinking Water and Sanitation Department is proposed taking support from professional agencies / NGOs for capacity building and to provide technical handholding support at the implementation stage for Solid Waste Management initiatives specially in creating Material Recovery facility. This creates end to end solution of dry waste management.
- XIII. Under **GOBARDHAN**,11 biogas projects have been approved in Udupi, Bengaluru Rural, Bengaluru Urban and Uttara Kannada district, out of which 5 projects have been implemented and remaining 7 projects are in progress.
- XIV. The Department has initiated four pilot Materials Recovery Facilities (MRFs) projects at four Districts which have been chosen on different geographical conditions i.e., Udupi, Dakshina Kannada, Ballari



and Ramanagara, with focus on implementing 10 TPD Material Recovery Facility in these locations for scientific management of dry waste.

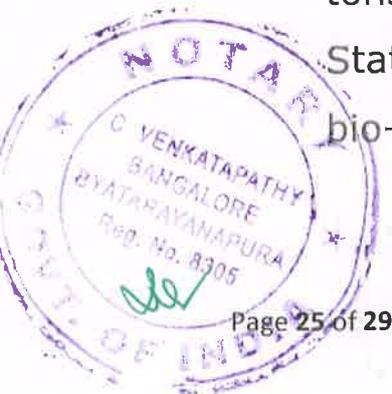
XV. In addition, Rural Drinking Water and Sanitation Department has taken the following IEC(Information Education and Communication) Initiatives:-

- ❖ Social Media Special Campaign
- ❖ Samudayik Shouchalaya Abhiyan
- ❖ Swachh Grama-SwachhParisara
- ❖ Drinking Water and Sanitation Special Campaign
- ❖ Swachotsava-Nityotsava
- ❖ Gandagi Mukta Bharath
- ❖ Swachhatha Pakhwada
- ❖ Established Parihara Call centre for addressing the grievances

**Karnataka State Pollution Control Board:-**

Key achievements /major steps taken up by the **Karnataka State Pollution Control Board** are detailed below;

- I. The Board has identified 36021 health care establishments in the State. It is estimated that 77.54 tons per day of biomedical waste is generated in the State, which is either treated in captive & 27 common bio-medical waste treatment facilities in the State.



**II. 3562 industries are covered under HOWM Rules, 2016. Details are as under;**

Karnataka	Total No. of Units	Total (MT/A)	Land fillable (MT/A)	Recyclable / Reused (MT/A)	Incinerable (MT/A)
	3562	196784.01	50255.76	121361.96	25166.29

III. E-Manifest System for monitoring and tracking of hazardous waste generated/process/transportation and disposal is being developed and implemented by KSPCB.

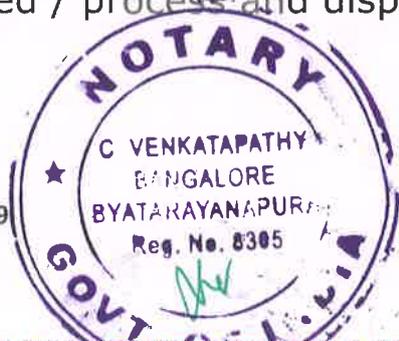
IV. Hazardous Waste Management: Board has issued consent to the following;

- Common Hazardous waste Incinerators – 8 Nos.
- Hazardous waste recycling units – 145 Nos.
- Co processing of Hazardous and Other waste in Cement Kilns -9 Nos.

**V. Status of E-Waste in Karnataka:**

Total E-Waste Generation in Karnataka in 2019-20	80,821.99 MT
Total E-Waste Recovered in 2019-20	11,690 MT

E-Manifest System for monitoring and tracking of e-waste generated / process and disposal is being developed by CPCB.



VI. **Status of E-Waste Processing units in Karnataka**

Type of E-waste units	No.
Dismantler	61
Recycler	35
Dismantler & Recycler	22
Refurbisher	11
Dismantler, Refurbisher & Recycler	7
Dismantler, Refurbisher	12
Refurbisher & Recycler	4
<b>Total</b>	<b>152</b>

**V. Non-attainment cities:** 4 non-attainment cities in the State are Bangalore, Hubli-Dharwad, Kalaburgi, Davangere.

-44 point action plan for Bangalore and 27 point action plan for other cities is being implemented by the line departments.

-Source Apportionment Study for Bangalore is completed.

-Source Apportionment Study for other cities is to be taken up.

-8 CAAQM Stations being installed to monitor air quality.

-Space for 4 CAAQM Stations in Bangalore will be developed.



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## VI. C& D Waste Management Rules 2016:

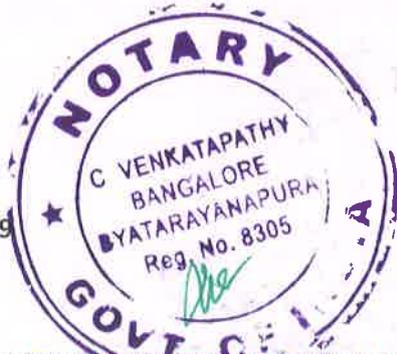
-Review meeting regarding implementation of C&D Waste Management Rules. 2016 was held with concerned Departments on 06.12.2016, 08.02.2021 and 12.02.2021.

-In Karnataka only one C&D Processing facility is operating i.e.,-M/s. Rock Crystals located at Chikkajala Bangalore with a capacity of 1000 TPD for which KSPCB has given authorization with condition to submit annual returns.

-M/s. Rubbel Revival Pvt Ltd., has obtained Consent For Establishment from KSPCB on 28.05.2020 to establish 750 MTPD plant in BBMP land located at Kannur village, Bangalore to process C&D waste.

-City Corporation, Mangalore have obtained CFE for establishment of the 20 TPD capacities C&D Waste processing unit at Pachhanady on 30.12.2020.

WHEREFORE, I respectfully pray that this Hon'ble Tribunal may be pleased to accept the above information in the interest of justice and equity.



DEPONENT

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**VERIFICATION**

I, the above named Deponent do hereby verify that all the facts stated in the affidavit are true to my knowledge and that no part thereof is false and nothing material is concealed there from.

Verified at BANGALORE on  
27<sup>th</sup> day of July 2021

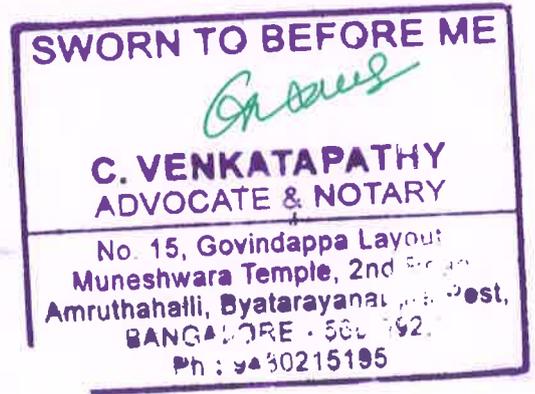
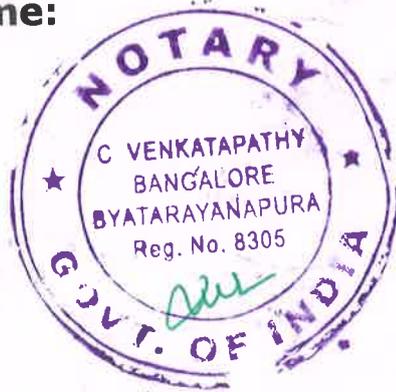


**DEPONENT**

CHIEF SECRETARY

GOVERNMENT OF KARNATAKA

**Identified by me:**



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DECLARATION

I hereby declare that the above is a true and correct copy of the original as shown to me by the person who has produced it for my inspection.

*[Signature]*  
Notary Public

*[Signature]*  
Deponent

BROUGHT TO BEFORE ME  
*[Signature]*  
 CLARENCE A. ...  
 Notary Public  
 State of ...  
 My Commission Expires ...  
 My Office is at ...  
 My Commission No. ...

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## Compliance to Solid Waste Management Rules 2016

Sl. No	SWM Rule Clause	Provisions of SWM Rules 2016	Implementation status of all Districts (All ULBs)	1	2	3	4	5	6
1	2								
1	4(a)& 15 (g)	Segregate and store the waste generated by them in three separate streams namely bio-degradable, non-biodegradable and domestic hazardous wastes Direct waste generators not to litter and to segregate the waste at source as prescribed under these rules	The ULBs are practicing source segregation of MSW into three streams. Littering is being tackled through IEC component under Swachh Bharat Mission followed by penal action.	100%	22%	March-2022	Project Directors DUDCs All Districts		
2	4(2)	No waste generator shall throw, burn or bury the solid waste generated by him, on streets, open public spaces outside his premises or in the drain or water bodies.	General public & all waste generators are practicing not to throw burn or bury the MSW.	100%	15%	March-2022			

3	4(3)& 15 (f)	All waste generators shall pay such user fee for solid waste management, as specified in the bye-laws of the local bodies	SWM cess is being collected along with property tax. Collection of SWM User fee will be implemented as per Karnataka Municipalities SWM Bye Laws 2019.	100%	60%	March-2022
4	4 (8)	All Bulk waste generator (resident welfare and market associations, gated communities and institutions with more than 5,000 Sq.m area & all hotels and restaurants) shall process and disposed off the bio-degradable waste through composting or bio-methanation within the premises as far as possible	The ULBs are insisting bulk waste generators to practice on-site composting. Levying penalty on violators as per the bye laws is being implemented.	100%	60%	March 2022(for above 1lakh population)
5	12(a)	Facilitate identification and allocation of suitable land for Processing & Disposal of MSW	Lands identified for MSW processing facility	100%	29%	March-2022
6	12(b)	Review the performance of local bodies, at least once in a quarter on waste segregation, processing, treatment and disposal and take corrective measures in consultation with UDD	The DCs are reviewing the progress of implementation of SWM Rules-2016 regularly.	100%	-	-
7	15(a)	Prepare a solid waste management plan as per state policy and strategy on solid waste management within six months from the date of notification (DPR under SBM can be considered as Action Plan)	The State SWM Policy & strategy is finalized DPRs for the newly upgraded ULBs are yet to be approved. <b>Instructions have been given to all newly upgraded ULBs to prepare DPR at earliest.</b>	100%	30%	Dec-2021

8	15(b)	Arrange for door to door collection of segregated solid waste from all households including slums and informal settlements, commercial, institutional and other non-residential premises	Door to door collection of waste is being carriedout in all the areas including slums and informal, settlements, commercial, institutional and other non-residential premises.	100%	2%	Dec -2021	
9	15(c)	Establish a system to recognise organisations of waste pickers or informal waste collectors and promote and establish a system for integration of these authorised waste pickers and waste collectors to facilitate their participation in solid waste management	Waste Pickers are identified in all ULBs. The integration is under process. SWM policy has given specific directions for integration of waste pickers.	100%	29.28%	Dec-2021(Due to Covid not much progress could be done in integration)	
10	15(d)& 15 (h)	Facilitate formation of Self Help Groups, provide identity cards and thereafter encourage integration in solid waste management. Setup material recovery facilities or secondary storage facilities with sufficient space for sorting of recyclable materials	30 Material Recovery Facilities at districts Headquarters steps will be taken to foration of waste pickers, Self Help Groups to an extent possible.	100%	90%	Dec-2021- DWCCs March-2022- MRF (in CCs & CMCs)	
11	15(e)	frame bye-laws incorporating the provisions of these rules within one year from the date of notification of these rules	Bye laws have been framed& notified	100%	Nil	Complied	
12	15(i)	Establish waste deposition centres for domestic hazardous waste and give direction for waste generators to deposit domestic hazardous wastes at	A facility at Dabaspete is setup to process the same, however practicing separate collection of domestic hazardous waste is under process.	100%	57.16%	Dec-2021	

13	15(k)	this centre for its safe disposal direct street sweepers not to burn tree leaves collected from street sweeping	Tree leaves are being collected separately to process in the parks.	100%	-	-
14	15(l)	Provide training on solid waste management workers & waste pickers.	Regular trainings are being conducted	100%	-	-
15	15(m)	Collect waste from vegetable, fruit, flower, meat, poultry and fish market on day to day basis and promote setting up of decentralised compost plant or bio-methanation plant at suitable locations in the markets	SWM bye law has mandated in-situ processing for bulk generators including market in SWM bye law	100%	50%	Dec-2021
16	15(p)	Collect horticulture, parks and garden waste separately and process in the parks and gardens, as far as possible	ULBs are practicing to process the waste by adopting decentralized method.	100%	60%	Dec-2021
17	15(t)	Involve communities in waste management and promotion of home composting, bio-gas generation, decentralised processing	Regular awareness is being carried out for promotion of home composting. Non-government organizations, college students are also being involved for awareness on home composting. SWM policy & Bye law envisages the concept of home/lane/ward/community composting	100%	50%	March-2022
18	15(v)	Construction, operation and maintenance of solid waste processing & disposal facilities	Civil works for solid waste processing & disposal facility are under construction as well as procurement process of vehicles and machineries will be completed soon.	100%	47%	March-2022

19	15(x)	Make adequate provision of funds for capital investments as well as operation and maintenance of solid waste management services in the annual budget	Sufficient funds are being allocated for SWM activities	100%	-		
20	15(za)	Prepare and submit annual report in Form IV on or before the 30th April of the succeeding year	ULBs are submitting before prescribed timelines.	100%	-	Completed	
21	15(zf)	Frame bye-laws and prescribe criteria for levying of spot fine for persons who litters or fails to comply with the provisions of these rules	Bye-Laws have been framed and notified. ULBs are in the process of adopting the same for implementing SWM Rules-2016.	100%	-	Completed	
22	15(zg)	Create public awareness through information, education and communication campaign and educate the waste generators	IEC programs are being conducted regularly to educate the public.	100%	-	-	
23	15 (zj)	Investigate and analyse all old open dumpsites and existing operational dumpsites for their potential of bio mining and bio-remediation/scientificcally capped	A Committee is being constituted by Government to guide the ULBs on eradication of legacy waste. Also all open dump sites have been identified by ULBs and appropriate action will be taken to reclaim the land.	100%	90%	26 cities with above 1lakh population in the State which has got large quantity legacy waste will be cleared by 2022.	

24	19, 20 & 21	Criteria for Duties regarding setting-up solid waste processing and treatment facility Criteria and actions to be taken for solid waste management in hilly areas Criteria for waste to energy process	It is ensured that the CPCB guidelines & CPHEEO manuals are referred for fixing all the criteria and incorporated in the DPRs prepared	100%	Nil	Complied
25	22	Time frame for implementation	The civil works for processing facilities are under progress whereas; the vehicles & machineries required for SWM activity will be bought from GEM portal. The ULBs were directed to ensure all obligations under SWM Rules-2016 are implemented adhering to timelines. But due to covid situation tendering process was halted for 6 month and State requires some additional time to ensure 100% compliance	100%	25%	2022
26	23	State Level Advisory Body (SLAB)	Meeting are being held regularly	100%	Nil	Complied
27	24	Annual report.	Submitted	100%	Nil	Complied

Sl. No.	Proposed activity as per SWM Rules 2016	Time frame for achieving
1	Identification of suitable sites for setting up solid waste processing facilities	Complied
2	Identification of suitable sites for setting up common regional sanitary landfill facilities for suitable clusters of local authorities under 0.5 million population and for setting up common regional sanitary landfill facilities or stand-alone sanitary landfill facilities by all local authorities having a population of 0.5 million or more.	NA
3	Procurement of suitable sites for setting up solid waste processing facility and sanitary landfill facilities	2021
4	Enforcing waste generators to practice segregation of bio degradable, recyclable, combustible, sanitary waste domestic hazardous and inert solid wastes at source	Complied through SWM bye law
5	Ensure door to door collection of segregated waste and its transportation in covered vehicles to processing or disposal facilities.	December-2021
6	Ensure separate storage, collection and transportation of construction and demolition wastes	December-2021
7	Setting up solid waste processing facilities by all local bodies having 100000 or more population	December -2021
8	Setting up solid waste processing facilities by local bodies and census towns below 100000 populations.	December-2021
9	Setting up common or stand-alone sanitary landfills by or for all local bodies having 0.5 million or more population for the disposal of only such residual wastes from the processing facilities as well as untreatable inert wastes as permitted under the Rules	NA
10	Setting up common or regional sanitary landfills by all local bodies and census towns under 0.5 million population for the disposal of permitted waste under the rules	NA
11	Bio-remediation or capping of old and abandoned dump sites	2022-above 1lakh population 2023-Other ULbs



Sl. No	SWM Rule Clause	Provisions of SWM Rules 2016	Implementation status of Bruhat Bengaluru Mahanagara Palike.				
1	2	3	4				
Compliance to duties of waste generators							
			Current Status	Desirable Level of Compliance in terms of statutes	Gap Between current status and desired levels	Proposal of attending the gap with time lines	Name and designation of designated officer for ensuring compliance to provisions under statute (Deputy Commissioner/ Project Director) with Mobile No.
1	4(a)& 15 (g)	Segregate and store the waste generated by them in three separate streams namely bio-degradable, non-biodegradable and domestic hazardous wastes  Direct waste generators not to litter and to segregate the waste at source as prescribed under these rules	Strict directions have been issued to all Wards to ensure source segregation of waste in three streams and implement SWM Rules-2016.  BBMP has started collecting wet / sanitary waste and dry waste separately and has directed its service agencies not to collect mixed waste from waste generators. with this we have reached 45% wet waste segregation level.  Littering is being tackled through IEC	100%	55%	More enforcement and levy of penalties along with IEC will help reach target by December 2021	SWM Cell officials and Zonal Joint Commissioners / CE's of all 8 zones of BBMP

			component under Swachh Bharat Mission followed by penal action. BBMP has deputed one marshall per ward to monitor and penalise any littering by persons			
2	4(2)	No waste generator shall throw, burn or bury the solid waste generated by him, on streets, open public spaces outside his premises or in the drain or water bodies.	Strict directions have been issued to all zonal Joint commissioners and their SWM officials to ensure no waste is burnt or buried. Fines for burning are being levied. 15 <sup>th</sup> Finance Commission grants under the name of work "Monitoring and Surveillance of open area susceptible fro burning of garbage and consequent control measures including setting up of Central Command Centre for monitoring of Solid Waste Management - Rs. 22.32 Crores" are being used to track vulnerable spots. This will be implemented by One years time	100%	20%	More enforcement and levy of penalties along with IEC will help reach target by December 2021
3	4(3)& 15 (f)	All waste generators shall pay such user fee for solid waste management, as specified in the bye-laws of the local bodies	SWM cess is being collected along with property tax.  Collection of SWM User fee in some form will be implemented as per SWM Bye Laws 2020. The modalities of collection of user fee and implementation is being worked out. Further, Govt approval is required for collection of User fees from waste generators	100%	100%	Users fees will be levied once government in principle gives nod to collect user fees
4	4 (8)	All Bulk waste generator (resident welfare and market associations, gated communities and institutions with more than 5,000 Sq.m area & all hotels and restaurants) shall	Circulars have been issued to ensure on-site composting is being adopted by all the bulk waste generators and to levy penalty as per the bye laws for Violators of this circular.  Now, that new company for Solid Waste Management in the name of "Bangalore Solid	100%	70%	BBMP had made this mandatory through its SWM Byelaws and ensure

  
 JOINT COMMISSIONER (SWM)  
 Bengaluru  
 Page 2 of 9

		process and disposed off the bio-degradable waste through composting or bio-methanation within the premises as far as possible	Waste Management Limited Co.” is formed, this will come out with a plan to execute the collection and composting/ bio meth plants within the premises of such waste generators.			compliance by July-2021	
5	12(a)	Facilitate identification and allocation of suitable land for Processing & Disposal of MSW	Additional Lands are being identified for MSW processing facility. Several letters are addressed to BDA for allocation of Lands for establishing decentralised processing units for waste management. As such 21 such sites are jointly inspected and identified. BDA has to hand over these sites to BBMP. Further, DC Bangalore Urban is also requested to provide lands for establishing waste processing units.	100%	25%	Additional sites for processing unsegregated and segregated waste have been identified. Land Allocation process is underway. (by April 2022)	
6	12(b)	Review the performance of local bodies, at least once in a quarter on waste segregation, processing, treatment and disposal and take corrective measures in consultation with UDD	Zonal Joint commissioners are conducting regular review of implementation of SWM Rules-2016 in their zones.  At SWM cell, BBMP, every fortnight reviews are held at level of Special and Joint Commissioners, SWM.	100%	—	All JCs are reviewing at zone level. Special Commissioner SWM is also reviewing on a 15 day basis.	

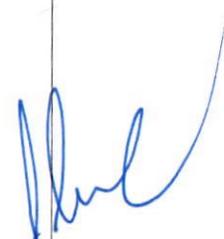
  
**JOINT COMMISSIONER (SWM)**  
 District Bangalore Urban & Bangalore Part B

7	15(a)	Prepare a solid waste management plan as per state policy and strategy on solid waste management within six months from the date of notification (DPR under SBM can be considered as Action Plan)	BBMP has a micro level waste management plan at ward level in the form of Blocks. Each block in a ward is based on 750 households based on which allocations of collection of waste and also street sweeping etc is prepared. The state policy is not yet prepared and hence, BBMP is awaiting the state policy.	100%	100%	By Dec 2021
8	15(b)	Arrange for door to door collection of segregated solid waste from all households including slums and informal settlements, commercial, institutional and other non-residential premises	Door to door collection of waste is done in all the wards including slums and informal settlements, commercial, institutional and other non-residential premises.  Wet, Sanitary and Dry Waste are collected separately.	100%	10%	With new tenders for collection and transportation in place, 100% coverage will be achieved by August 2021
9	15(c)	Establish a system to recognise organisations of waste pickers or informal waste collectors and promote and establish a system for integration of these authorised waste pickers and waste collectors to facilitate their participation in solid waste management	Waste Pickers are identified in all wards. Integration of them is under process.  Some of them are integrated into Maintenance and operation of Dry Waste Collection Centres.  Govt has mandated that those running Dry Waste Collection Centres (ie Waste pickers & Women SHGs) shall also go in for collection of Dry Waste.	100%	30%	By August 2021
10	15(d)& 15 (h)	Facilitate formation of Self Help Groups, provide identity cards and thereafter encourage integration in solid waste management. setup material recovery	Self Help Groups were utilized for collection & transportation of Household waste generated in Residential area.  For material recovery, facilities are being established at 10 different locations. Further	100%	70%	August -2022

		facilities or secondary storage facilities with sufficient space for sorting of recyclable materials	Tenders are in process for construction of new Dry waste collection centres at 28 locations. These will be implemented by one year time. Larger Aggregator Centres of capacity 100 MT at Two locations is planned for and the Tenders are in process. This would also take One year time				
11	15(e)	Frame bye-laws incorporating the provisions of these rules within one year from the date of notification of these rules	SWM Bye laws have been framed and BBMP council has approved. The Govt has also approved the Bye Laws.  SWM Byelaws of BBMP stands Notified.	100%	100%	Complied	
12	15(i)	Establish waste deposition centres for domestic hazardous waste and give direction for waste generators to deposit domestic hazardous wastes at this centre for its safe disposal	Directions have been issued. However, a facility at Dabaspete is setup to process the same. In BBMP , Tenders are invited to collect and transport to disposal location scientifically.	100%	100%	Complied	
13	15(k)	Direct street sweepers not to burn tree leaves collected from street sweeping	Monitoring is being at ward level, by strict supervision of Supervisors and also by Marshals and JHIs who can fine.	100%	60%	Dec-2021	
14	15(l)	Provide training on solid waste management workers & waste pickers.	Regular trainings are being conducted by reputed agencies like EMPRI, who impart good training with regular followup.	100%	20%	Its a continuous process	
15	15(m)	Collect waste from vegetable, fruit, flower, meat, poultry and fish market on day to day basis and promote setting up of decentralised compost plant or bio-methanation plant at suitable locations in	Decentralised processing plants, like Bio-mechanization plants, Lane composting, Tender Coconut processing plant would be set up. Tenders are invited for construction of One Larger Bio Meth plant of 50 MT capacity. Further, Tenders are in process for construction of 4 Nos. 5 MTPD capacity Bio	100%	65%	July-2022	

  
**JOINT COMMISSIONER (SWM)**  
 District Bangalore Metropolitan Police

		the markets	Meth new plants and also Upgradation of existing 7 Nos 5 MTPD Bio Meth plants are in progress. BBMP has also planned to establish through M/s GAIL Gas ltd 300MTPD capacity Bio-CNG plant. BBMP has given a commitment letter to M/s.GAIL Gas at their own cost. Further, Tenders are invited for establishing compost units at all zones.			
16	15(p)	Collect Horticulture, Parks and garden waste separately and process in the parks and gardens, as far as possible	Directions have been issued to all Horticulture Superintendents and also to process the same in decentralized method by digging pits for leaf litter, lane composting, Shredder and chopper machines. Tenders are invited for procurement of Shredder and Choppers in all the zones. These will be established in parks to shred the leaf and wood that would fall.	100%	30%	July-2022
17	15(t)	involve communities in waste management and promotion of home composting, bio-gas generation, decentralised processing	Regular awareness is being carried out for promotion of home composting. Non-government organizations, college students are also being involved for awareness on home composting.  IN HSR LAYOUT, KALIKA KENDRA is established by the community participation, where in all methods of composting units are established.	100%	50%	July-2022
18	15(v)	Construction, operation and maintenance of solid waste processing & disposal facilities	Solid waste processing & disposal facility is constructed, operated & maintained at 8 locations processing about 1250 MTD	100%	20%	Apr-2022



JOINT COMMISSIONER (SWM)

Bangalore Mahanagara Palika

19	15(x)	Make adequate provision of funds for capital investments as well as operation and maintenance of solid waste management services in the annual budget	Sufficient funds are being allocated for SWM activities under BBMP Budget, Nava Nagaroththana, Shubra Bangaluru grants by GOK.	100%	-	Complied	
20	15(za)	Prepare and submit annual report in Form IV on or before the 30th April of the succeeding year	Annual report for SWM,PWM and C &D Waste are submitted upto 20-21 in prescribed formats to KSPCB.	100%	-	Complied	
21	15(zf)	frame bye-laws and prescribe criteria for levying of spot fine for persons who litters or fails to comply with the provisions of these rules	Bye laws have been framed and BBMP council has approved. Further final notification of SWM Byelaws is published in news papers	100%	-	Complied	
22	15(zg)	create public awareness through information, education and communication campaign and educate the waste generators	IEC programs are conducted regularly to educate the public by Link Workers at ward block levels , door to door campaign. Also ward Marshals go on rounds in patrol vehicle provided by BBMP at the time of door to door collection and educate public intensively. Further under Shubra Bangalore grants funds are made available for IEC activities. This will be implemented by One years time	100%	50%	Apr-2022	
23	15(zj)	investigate and analyse all old open dumpsites and existing operational dumpsites for their potential of bio mining and bio-remediation/ scientifically	Also all open dump sites have been identified and tenders are being invited for appointing agency for Bio remediation at Bagalur and Bellhalli. Further Tenders for Bio mining at Mandur legacy waste site is to be invited.	100%	75%	Dec-2022	

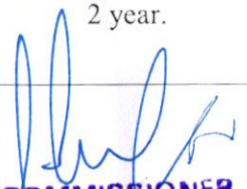
  
**JOINT COMMISSIONER (SWM)**  
 Bengaluru Nagaroththana

		capped				
24	19, 20 & 21	Criteria for Duties regarding setting-up solid waste processing and treatment facility  Criteria and actions to be taken for solid waste management in hilly areas.-  Criteria for waste to energy process	Action is taken to ensure that the CPCB guidelines & CPHEEO manuals are referred for fixing all the criteria.  Waste to Energy plants are proposed to be established at 5 locations, on PPP model, and Tender basis. In one plant, private concessionaire has taken over site.  Agreement has been entered into with KPCL for establishment of Waste to Energy plants and civil works has started.	100%	50%	Dec-2022
25	22	Time frame for implementation	The wards are directed to ensure all obligations under SWM Rules-2016 are implemented adhering to timelines.	100%	50%	Dec-2022
26	23	State Level Advisory Body (SLAB)	Meeting are being held frequently as and when required under ACS UDD chairmanship.	100%	-	N.A to BBMP
27	24	Annual report.	Submitted	100%	-	Complied

  
**JOINT COMMISSIONER (SWM)**  
 Bruhat Bangalore Mahanagara Palike

## Compliance to Solid Waste Management Rules 2016

Sl. No.	Proposed activity as per SWM Rules 2016	Time frame for achieving
1	Identification of suitable sites for setting up solid waste processing facilities	Complied
2	Identification of suitable sites for setting up common regional sanitary landfill facilities for suitable clusters of local authorities under 0.5 million population and for setting up common regional sanitary landfill facilities or stand-alone sanitary landfill facilities by all local authorities having a population of 0.5 million or more .	NA
3	Procurement of suitable sites for setting up solid waste processing facility and sanitary landfill facilities	Complied
4	Enforcing waste generators to practice segregation of bio degradable, recyclable, combustible, sanitary waste domestic hazardous and inert solid wastes at source ,	1 year.
5	Ensure door to door collection of segregated waste and its transportation in covered vehicles to processing or disposal facilities.	3 months.
6	Ensure separate storage, collection and transportation of construction and demolition wastes	6 months.
7	Setting up solid waste processing facilities by all local bodies having 100000 or more population	1 year.
8	Setting up solid waste processing facilities by local bodies and census towns below 100000 population.	NA
9	Setting up common or stand-alone sanitary landfills by or for all local bodies having 0.5 million or more population for the disposal of only such residual wastes from the processing facilities as well as untreatable inert wastes as permitted under the Rules	1 year.
10	Setting up common or regional sanitary landfills by all local bodies and census towns under 0.5 million population for the disposal of permitted waste under the rules	NA
11	Bio-remediation or capping of old and abandoned dump sites	2 year.

  
**JOINT COMMISSIONER (SWM)**  
 Bruhat Bangalore Mahanagara Palike

**Rural Drinking Water and Sanitation Department**  
**Proposed activity as per SWM Rules 2016 with time lines for achieving**

Sl.No.	Proposed activity as per SWM Rules 2016	Time frame for achieving
1	Identification of suitable sites for setting up solid waste processing facilities	Out of 5992 GPs 5397 GPs have identified suitable land. Remaining will be complied by <b>March-2022</b>
2	Identification of suitable sites for setting up common regional sanitary landfill facilities for suitable clusters of local authorities under 0.5 million population and for setting up common regional sanitary landfill facilities or stand-alone sanitary landfill facilities by all local authorities having a population of 0.5 million or more.	NA
3	Procurement of suitable sites for setting up solid waste processing facility and sanitary landfill facilities	<b>March-2022</b>
4	Enforcing waste generators to practice segregation of biodegradable, recyclable, combustible, sanitary waste domestic hazardous and inert solid wastes at source,	Out of 5992 GPs 1227 GPs are practicing source segregation. Rest will be complied by <b>March-2022</b> .
5	Ensure door to door collection of segregated waste and its transportation in covered vehicles to processing or disposal facilities.	Out of 5992 GPs 2054 GPs are processing waste. Rest will be complied by <b>March-2022</b> .
6	Ensure separate storage, collection, and transportation of construction and demolition wastes	NA
7	Setting up solid waste processing facilities by all local bodies having 100000 or more population	NA
8	Setting up solid waste processing facilities by local bodies and census towns below 100000 population.	<b>March-2022</b>

Sl.No.	Proposed activity as per SWM Rules 2016	Time frame for achieving
9	Setting up common or stand-alone sanitary landfills by or for all local bodies having 0.5 million or more population for the disposal of only such residual wastes from the processing facilities as well as untreated inert wastes as permitted under the Rules	NA
10	Setting up common or regional sanitary landfills by all local bodies and census towns under 0.5 million population for the disposal of permitted waste under the rules	NA
11	Bio-remediation or capping of old and abandoned dump sites	NA

  
**COMMISSIONER**  
 Rural Drinking Water and Sanitation Dept.

ಫ್ಯಾಕ್ಸ್ / Fax : 080-25586321

ಈಮೇಲ್ / Email : ho@kspcb.gov.in

ವೆಬ್‌ಸೈಟ್ / Website : http://kspcb.gov.in



080-25581383, 25589112  
080-25589113, 25589114

ಕರ್ನಾಟಕ ರಾಜ್ಯ ಮಾಲಿನ್ಯ ನಿಯಂತ್ರಣ ಮಂಡಳಿ  
**Karnataka State Pollution Control Board**

“ಪರಿಸರ ಭವನ”, 1 ರಿಂದ 5ನೇ ಮಹಡಿಗಳು, ನಂ. 49, ಚರ್ಚ್ ಸ್ಟ್ರೀಟ್, ಬೆಂಗಳೂರು - 560 001, ಕರ್ನಾಟಕ ರಾಜ್ಯ, ಭಾರತ  
“Parisara Bhavan”, 1st to 5th Floor, # 49, Church Street, Bangalore - 560 001, Karnataka State, India

No. PCB/WMC/3142/MSW/NGT/2021-22 84

Date: 19 JUL 2021

To,  
The Director  
Directorate of Municipal Administration,  
Vishweshwaraiah Towers,  
Bangalore -560001

Sir,

Sub:- Submission of quarterly Compliance report in the matter  
of O.A. No. 606/2018.

\*\*\*\*\*

With reference to the above subject, please find herewith enclosed information  
filled in the given formats pertaining to this Board in compliance in the matter  
of O.A. No. 606/2018 as on 15.07.2021.

- Compliance to the Solid Waste Management Rules, 2016 is marked as Annexure -R1.
- Compliance to the Biomedical Waste Management Rules, 2016 is marked as Annexure -R2.
- Compliance to the Construction & Demolition Waste Management Rules, 2016 is marked as Annexure -R3.
- Compliance to the Hazardous & Other Waste (Management & Transboundary Movement) Rules, 2016 is marked as Annexure -R4.
- Compliance to the E-waste Management Rules, 2016 is marked as Annexure -R5.
- Information about 351 Polluted Stretches in the country is marked as Annexure -R6.
- Information about 122 Non-attainment Cities is marked as Annexure -R7.
- Information about 100 industrial cluster is marked as Annexure -R8.



20/7  
EE, SWM

- Status of Sewage Treatment Plants (STPs) & Reuse of Treated Sewage is marked as Annexure -R9.
- Status of CETPs /ETPs including performance is marked as Annexure - R10.
- Air Pollution including Noise Pollution is marked as Annexure -R11.

In Annexure - R11 information in Sl. No. (9) & (13) may be obtained from DGP, Bangalore City Police.

This is for your kind information and further needful.

**Encl:** As above

Yours sincerely,

  
Member Secretary

Annexure R1

Status of Implementation of SWM Rules, 2016

Sl. No.	Thematic area	Current Status	Desirable level	Gap between current status and desired levels	Time lines for attending gaps	Name and designation of the Designated Officer for ensuring compliance
1	Enforce these rules in their State through local bodies in their respective jurisdiction and review implementation of these rules at least twice a year in close coordination with concerned Directorate of Municipal Administration or Secretary-in-charge of State Urban Development Department	<p>Review meetings are held with Urban Development Department and Director of Municipal Administration, Government of Karnataka regarding implementation of MSW Rules, 2016. Review meeting held on 01.07.2019 and following directions were issued.</p> <p>1. Department of Urban Development and Department of Rural Development and Panchayathraj shall take immediate action to publish the state policy on Solid Waste Management as required under the Rules.</p> <p>2. The Department of Municipal Administration and BBMP shall submit the Annual report to the State Board including the best practices followed by local bodies within 7 days.</p> <p>3. The time limit stipulated for management of Solid Waste under the Rules are not complied by the local bodies. Hence, Director of Municipal Administration and BBMP shall initiate action on war footing.</p> <p>4. All the Solid Waste Transportation vehicles shall be fitted with GPS.</p> <p>5. Efforts should be made for complete segregation of waste at the source, not to mix segregated waste with the un-segregated waste. And also the facilities available for processing of waste shall be completely utilized.</p> <p>6. Letter addressed to all local bodies on 04.06.2021 intimating to submit action taken report for noncompliance observed by Comptroller and Auditor General of India in Report No. 4 of the year 2018.</p>	100%	50%	31.12.2021	Member Secretary, KSPCB, Bangalore Senior Environmental Officer, Waste Management Cell, KSPCB, Bangalore

2	Monitor environmental standards and adherence to conditions as specified under the Schedule I and Schedule II for waste processing and disposal sites.	Regular inspections of MSW sites are carried out by Regional Officers and monitoring is carried out wherever required.	100%	50%	31.12.2021	
3	Examine the proposal for authorisation and make such inquiries as deemed fit, after the receipt of the application for the same in Form I from the local body or any other agency authorised by the local body;	After the receipt of application, the facilities are inspected by the Regional officers and reports submitted to HO for further action. H.O. take necessary step to dispose of the application within fixed time frame.	100%	0%	Complied	
4	While examining the proposal for authorisation, the requirement of consents under respective enactments and views of other agencies like the State Urban Development Department, the Town and Country Planning Department, District Planning Committee or Metropolitan Area Planning Committee, as may be applicable, Airport or Airbase Authority, the Ground Water Board, Railways, power distribution companies, highway department and other relevant agencies shall be taken into consideration and they shall be given four weeks time to give their views, if any	Board has formed a Committee for disposal of the authorization applications. The Committee consisting of all the agencies indicated under this Rule. Concurrence of the Committee members will be taken for disposal of applications.	100%	0%	Complied	

5	Issue authorisation within a period of sixty days in Form II to the local body or an operator of a facility or any other agency authorised by local body stipulating compliance criteria and environmental standards as specified in Schedules I and II including other conditions, as may be necessary;	Authorization is issued within the time frame and stipulating compliance criteria and environmental standards as specified in Schedules I and II including other conditions, as may be necessary	100%	0%	Complied	
6	Synchronise the validity of said authorisation with the validity of the consents	the validity of the consent and authorisation are synchronised	100%	0%	Complied	
7	Suspend or cancel the authorization issued under clause (a) any time, if the local body or operator of the facility fails to operate the facility as per the conditions stipulated: provided that no such authorization shall be suspended or cancelled without giving notice to the local body or operator, as the case may be;	Authorization is cancelled / suspended after following due procedure as per rules.	100%	0%	Complied	
8	On receipt of application for renewal, renew the authorisation for next five years, after examining every application on merit and subject to the condition that the operator of the facility has fulfilled all the provisions of the rules, standards or conditions specified in the authorisation, consents or environment clearance.	Board has formed a committee for disposal of the authorization applications. The committee consisting of all the agencies indicated under this Rule 16(1)(d). Based on the deliberations and recommendations of the committee, action is initiated to dispose the authorization applications	100%	75%	31.12.2021	

9	The State Pollution Control Board or Pollution Control Committee shall, after giving reasonable opportunity of being heard to the applicant and for reasons thereof to be recorded in writing, refuse to grant or renew an authorisation	Procedure is being followed.	100%	0%	Complied	
10	In case of new technologies, where no standards have been prescribed by the Central Pollution Control Board, State Pollution Control Board or Pollution Control Committee, as the case may be, shall approach Central Pollution Control Board for getting standards specified.	whenever the local body approaches the Board with new technologies for Management of Solid Waste, CPCB will be approached for getting standards specified.	100%	0%	Complied	
11	The State Pollution Control Board or the Pollution Control Committee, as the case may be, shall monitor the compliance of the standards as prescribed or laid down and treatment technology as approved and the conditions stipulated in the authorisation and the standards specified in Schedules I and II under these rules as and when deemed appropriate but not less than once in a year.	Regional Officers of KSPCB regularly inspect and monitor the compliance standards of the MSW sites as per Schedules I and II.	100%	On going activity	On going activity	

12	The State Pollution Control Board or the Pollution Control Committee may give directions to local bodies for safe handling and disposal of domestic hazardous waste deposited by the waste generators at hazardous waste deposition facilities.	KSPCB had issued directions under section 5 of the Environment (Protection) Act, 1986 on 14-12-2017 to Director of Municipal Administration to establish waste depositing centres for domestic hazardous waste and to ensure transportation to the Hazardous waste disposal facility.	100%	Nil	Complied by KSPCB (Not complied by local bodies)	
13	The State Pollution Control Board or the Pollution Control Committee shall regulate Inter-State movement of waste.	There are issues regarding illegal interstate transportation of waste from Kerala State. The issue has been taken up with CPCB and also Kerala State Pollution Control Board. In addition FIR has been registered in the local police station against the transporter of waste. Now, the illegal transportation has been closely monitored and there are no fresh incidents of illegal interstate transportation of waste from Kerala State. Letter addressed to Regional Director, CPCB to provide guidance the KSPCB on inter-state movement of waste as per Rule 14(j) of the Municipal Solid Waste Rules, 2016 on 12.07.2021. Regional Officer, Mangalore has been directed to investigate and report about waste received from lakshadweep at Mangalore port on 14.07.2021.	100%	0%	Complied	
14	Each State Pollution Control Board or Pollution Control Committee as the case may be, shall prepare and submit the consolidated annual report to the Central Pollution Control Board and Ministry of Urban Development on the implementation of these rules and action taken against non-complying local body by the 31st day of July of each year in Form-V.	After receipt of the annual report of each local bodies of the state from DMA and BBMP, the data is compiled and annual report is submitted by KSPCB to CPCB within the time frame. <b>Annual report for the year 2019-20 is submitted on 05.02.2021 to CPCB.</b>	100%	0%	Complied	



Compliance to Bio-Medical Waste Management Rules 2016

Sl. No.	Thematic area	Current Status	Desirable level	Gap between current status and desired levels	Time lines for attending gaps	Name and designation of the Designated Officer for ensuring compliance
1	Why inventory on numbers of Healthcare Facilities is still incomplete in state/UT, as required under BMWWM Rules, 2016?	Biomedical waste generated in Karnataka was reported to Central Pollution Contort Board as 77,545.6 kg/d for the year 2019. Annual Report is prepared based on the inventorization details submitted by Regional Offices of the Board. Letter addressed to Common Biomedical waste treatment facilities (Date: 22.04.2021), Drug control department (Date: 03.06.2021) and State Nadal Officer GEF-MOEFFC-UNIDO Project (Date: 04.06.2021)to assess quantity of biomedical consumables consumed in	100%	25%	31.12.2021	Member Secretary, KSPCB, Bangalore Senior Environmental Officer, Waste Management Cell, KSPCB, Bangalore
2	What is the reason that inventory is still under process?	Every year new HCEs are being established in the State. Hence, inventory is a continuous process. However, the Regional Officers of the Board are instructed to update the list of HCEs with the District Health Officers.	100%	25%	31.12.2021	

3	As observed that non-bedded HCFs have not applied for authorization, why such HCFs are allowed to operate without authorisation under BMW Rules, 2016?	Prior to 2016, clinics with less than 1000 patients per month were not required to obtain authorization. After 2016, the KSPCB has started covering all the HCFs and issuing authorization.	100%	5%	31.12.2021	
4	How many applications are still under process with State Boards for grant of authorisation?	1022 as on 15.07.2021	100%	2.83%	31.12.2021	
5	In case of no Common Bio Medical Waste Treatment Facility in Arunachal Pradesh, Andaman & Nicobar, Goa, Lakshadweep, Mizoram, and Nagaland & Sikkim State/ UT for setting up CBMWTF?	Not Applicable				
6	Why still there is no proposal submitted by Arunachal Pradesh, Andaman Nicobar, Goa, Lakshadweep, Mizoram, and Nagaland & Sikkim State/UT for setting up CBMWTF?	Not Applicable				

7	<p>Why Barcode system is not implemented in Andaman Nicobar, Arunachal Pradesh, Assam, J&amp; K, Lakshadweep, Mizoram, Orissa, Puducherry, Sikkim, Uttar Pradesh, West Bengal, Chandigarh, Delhi, Jhaerkhand, Madhya Pradesh, Maharashtra, Rajasthan and Tamil Nadu, so far even when the deadline is over as per BMW Rules, 2016?</p>	Not Applicable				
8	<p>Whether State/ UT has constituted State Advisory Committee so as to review the implementation status?</p>	Yes	100%	100%	100%	

9	<p>What step have been taken by Advisory Committee so as ensure implementation of BMW Rules, 2016?</p>	<p>The State Advisory Committee was formed in 04.08. 2016 and the last meeting was held on 10.04.2019. Later the Committee was amended on 14.10.2019. Understanding the inability of the Healthcare Facilities to make payment to the service of the CBMWTF, Rs. 73.86 Lakh was released and distributed to 42 Healthcare Facilities to clear the pending payments. Then separate Budget for BMW was proposed in PIP-2020-21. Only the running cost was approved which is yet to be released. Similarly Proposal for formation of State Programme Management Unit &amp; for implementation of BMW Rules 2016 is proposed to the State Government. OM has been issued nominating Nodal Officers in all Districts to review &amp; monitor BMW.</p>	<p>On going</p>	<p>On going</p>		<p>Department of Health &amp; Family Welfare, GoK.</p>
10	<p>How many HCFs other than hospitals, nursing homes etc. Such as veterinary hospitals, animal houses, Ayush hospitals have been monitored?</p>	<p>3078 Veterinary, 29 Animal Houses and 1708 numbers of Ayush hospitals have been covered by KSPCB. Letter has been addressed by KSPCB to the Department of Animal Husbandry to comply with BMW Rules, 2016.</p>	<p>On going continuous process</p>	<p>On going continuous process</p>		

11	What is the frequency for conducting training or building capacity programmes for State Board Officials and for staff of HCFs?	842 trainings were organised by CBMWTF operators for HCFs during 2018-19. All Technical Officers of the Board are well trained in BMW Rules, 2016. Letter addressed to Mission Director -NHM, State Nodal Officer, GEF-MOEFCC-UNIDO Project, Karnataka, 4th Floor, Arogya Soudha, Magadi Road, Bengaluru - 560023	100%	25%	31.12.2021	
12	What is the status of installation of Continuous Online Emission Monitoring System with CBMWTFs? What follow-up action has been taken by State Boards?	26 CBMWTFs have installed Continuous Online Emission Monitoring System	100%	0%	Complied	
13	How OCEMS data received by State Boards is being validated?	Manual stack monitoring will be undertaken and OCEMS data will be validated.	100%	-	It is a continuous process	
14	What is the status of compliance to BMW Rules, 2016 by CBMWTFs? What action has been taken against defaulting facilities?	Action taken in first two quarters is enclosed as annexure -R2a.	100%	10%	31.12.2021	

15	What is the frequency of monitoring of Healthcare Facilities for verification of compliance to BMWWM Rules?	As per letter Dt. 25.04.2021 in the matter fo O.A. 110 of 2020 Action taken report on quarterly basis is being submitted to CPCB.	100%	75%	31.12.2021	
16	Compliance to guidelines issued by the CPCB in respect of scientific management and disposal of the COVID biomedical waste by the KSPCB.	The KSPCB has developed inhouse software application for accounting the generation of the COVID biomedical waste generated from HCEs, QCs and other facilities and same is being monitored by the Bio Medical Waste Team constituted by the Govt. of Karnataka. The Team is meeting every week to monitor the generation and disposal of the COVID Biomedical Waste about 4113.2 Tons of COVID Biomedical Waste has been generated from January 2020 to till end of the June, 2021 (Enclosed as Annexure - R2b) and same is collected and disposed scientifically in 26 nos. of CBMWTFDF. Also CPCB tracking software in respect of COVID Biomedical Waste is also being put into used by many of the HCEs and CBMWTFDFs.	100%	25%	31.12.2021	Member Secretary, KSPCB, Bangalore Senior Environmental Officer, Waste Management Cell, KSPCB, Bangalore

**ACTION TAKEN ON CBMWTF IN KARNATAKA STATE IN FIRST AND SECOND QUARTER OF 2021**

Sl.No	Name of the CBMWTF	Inspector	Show cause Notice	Notice of Proposed direction	Closure Order	Seizure	Criminal Case	Personal Hearing	Environmental Compensation forwarded to Head Office	Notice	Remarks
1	M/s. Anu Auto Clave and Incin Services., Sy No.145/2, Gullahalli Village, Hoskote Taluk, Bengaluru Rural District	11.01.2020						30.03.2021		Notice issued on 09.04.2021 as OCEMS parameters was exceeded the Norms for 10 days.	The CBMWTF was inspected on 05.03.2021 to verify the status of working. The gate sealed earlier by municipal corporation belgavi was intact.
2	M/s. Association of Medical Establishment, Sy No.12, Khasabag Taluk, Belgaum District		Issued by Regional Office on 19.03.2021					16.04.2021			

3	M/s. Ayush Enviro tech Pvt Ltd., Plot No.43, Nandikoor Industrial Area, KIADB Nandikoor Village, Udupi Taluk & District																			
4	M/s. Belgaum Green Environmental Management, Sy No.29, Haroogoppa Village, Haroogoppa-Murgoud Road, Soundatti Taluk, Belgaum District																			
5	M/s Brundhavana Foundation , Sy No.139,Sharansirsigi Village, Kalaburgi Taluk and District																			
6	M/s. Enviro Biotech, Bidar																			
7	M/s. Gadag Enviro Tech Pvt Ltd., Gadag																			
8	M/s. Gips Bio-Tech Lessee of M/s.Sri Jacob James, Sy No.82, Gujjegowdanapura Village,Jayapura Hobli,Mysuru Taluk and District	19.02.2021																		Notice issued on 06.01.2021 as OCEMS parameters was exceeded the Norms for 2 days



14	M/s. Prajwal BMW Management Systems, ( A Unit of V V Incin Solutions Pvt Ltd.),Plot No.1B/9, KIADB Industrial Area, Hassan-573 201																			
15	M/s. Prajwal BMW Management Systems (A Unit of VV Incin Solutions Private Limited) Plot No 56, Gowribidanur KIADB Industrial Area, Gowribidanur (T), Chikkabalapura																			
16	Raichur Indian Medical Association CBMWTF, Raichur	06.02.2021																		
17	Ramky Energy and Environmental Pvt Ltd., Mangalore																			
18	M/s. Shree consultants, Sy No.25, Varun Village, Mysore Taluk & District																			
19	M/s. The Shushrutha Bio Medical Waste Management Society., Plot No.31/C, Machenahalli Industrial Area, Bhadravathi, Shimoga																			Notice issued on 09.04.2021 as OCEMS parameters was exceeded the Norms for 15 day



25	M/s. Medicare Environmental Management Pvt Ltd., Plot No.39, KIADB Ind Area, Dabaspeta, Sompura Hobli, Nelmangala Taluk																			
26	M/s. Maridi Bio Industries Pvt Ltd., 35th mile stone, Sy No.1/37, 1/38, Gabadikaval Village, Kanakapura Road, Harohalli Hobli, Kanakapura Taluk, Ramagara District-562112																			Notice issued on 09.04.2021 as OCEMS parameters was exceeded the Norms for one day
27	M/s Rio Green Environ India ASTS, 126/L, Tarihal Industrial Area, Tarihal. Hubli-580 026.																			



SENIOR ENVIRONMENTAL OFFICER  
WASTE MANAGEMENT CELL

<b>Month</b>	<b>COVID-19 waste in Kg</b>
Jan 2020	180
Feb 2020	472
Mar 2020	2296
Apr 2020	65079
May 2020	162665
Jun 2020	174798
Jul 2020	544546
Aug 2020	642738
Sep 2020	561121
Oct 2020	394934
Nov 2020	156266
Dec 2020	100272
Jan 2021	68390
Feb 2021	42117
Mar 2021	54563
Apr 2021	186436
May 2021	587910
Jun 2021	368420
	4113203



## Implementation of C &amp; D Waste Management Rules, 2016 by KSPCB

Sl. No.	Thematic area	Current Status	Desirable level	Gap between current status and desired levels	Time lines for attending gaps	Name and designation of the Designated Officer for ensuring compliance
1	Identification of Site for collection & processing facility	BBMP has proposed another facility with M/s Rock Crystals has proposed to establish 750 MTPD plant in BBMP land located in Kannur village, Bangalore and one more facility of capacity 20 TPD to be established by the Managalore City Corporation at Pachanady to process C&D waste. Sites for C& D wastes have been identified at Shivalli (50TPD) Hubli – Dharwad, at Vantamuri, Srinagar Belagavi, Mangalore, Mysore and Kalburgi.	100%(One C & D Facility in each District)	80	Action taken by KSPCB is enclosed as ANNEXURE. (Time line as given by UDD is December 2021)	Member Secretary, KSPCB, Bangalore Senior Environmental Officer, Waste Management Cell, KSPCB, Bangalore
2	Commissioning & implementation of facility	M/s. Rock Crystals has established 1000 TPD C and D processing facility at Chikkajala, Bangalore	100%(One C & D Facility in each District)	96.7	31.12.2021 (as given by UDD)	
3	Formulation of policy by State Government	Draft policy is finalized by UDD, Govt. of Karnataka	100%	100%	Complied	The State has finalized the draft policy and same has been challenged in the Hon'ble High Court of Karnataka.



### **Implementation of C & D Waste Management Rules, 2016 by KSPCB.**

- (A) Board on 18.10.2016 had requested Secretary, Department of Ecology & Environment to convene a meeting of all concerned departments regarding implementation the C & D Waste Management Rules, 2016.
- (B) Additional Chief Secretary Forest, Ecology & Environment has convened a meeting on 06.12.2016. The meeting was attended by Urban Development, P.W.D, B.B.M.P, Revenue, and RDPR. During the meeting following issues discussed;
1. Formulation of policy by State Government
  2. Identification of Site for collection & processing facility
  3. Commissioning & implementation of facility
  4. Monitoring by SPCB's
- (C) KSPCB has issued directions under Section (5) of the Environment (Protection) Act, 1986 read with Rule 4 & 6 of C & D Waste Management Rules, 2016 on 05.05.2017 to Lake Authority Development, BDA, BBMP and Karnataka Rural development department , PWD, CPWD, BMRCL regarding implementation of the provisions of the C & D Waste Management Rules, 2016.
- (D) Directions under Section 5 of Environment (Protection) Act was issued on 10.05.2017 directing BBMP not to dump C & D & Solid Waste in the catchment area and also within Bellandur Lake.
- (E) Review meeting regarding implementation of the C & D Waste Management Rules, 2016 was held with BMRCL, BDA, Karnataka PWD, CPWD, KREDAI, DMA, N.H. (CPCB representative was also present) on 20.11.2017 proceedings communicated on 02.02.2018.
- (F) Letter addressed to Urban development Department on 24.2.2018 to prepare policy document as required under C & D Waste Management Rules.
- (G) A letter was addressed to BBMP on 11.02.2019 to establish C & D Collection Centre at different locations so as to cater to all the wards.
- (H) As per CPCB letter dtd: 18.02.2019 letter addressed to BBMP and M/s.Rock Crystals for implementation of C & D waste Management Rules. 2016.
- (I) Review meeting regarding implementation of C& D Waste Management Rules. 2016 was held with BBMP, BMRCL, KUWS &DB, BWSSB,

BDA, BESCOM, KSDB, CREDAL, Regional Director, CPCB on 08.02.2021 and 12.02.2021 under the chairmanship of Hon'ble Justice Subhash B. Adi, Proceedings communicated on 25.02.2021.

### C & D Facilities

**Existing facility** -M/s. Rock Crystals located at Chikkajala Bangalore of capacity 1000 TPD for which KSPCB has given authorization and it is operating.

### **Proposed facility**

1. M/s. Rubbel Revival Pvt Ltd., has obtained Consent For Establishment from KSPCB on 28.05.2020 to establish 750 MTPD plant in BBMP land located at Kannur village, Bangalore to process C&D waste. Sites for C& D wastes have been identified at Shivalli (50TPD) Hubli - Dharwad, at Vantamuri, Srinagar Belagavi, Mangalore, Mysore and Kalburgi.
2. City Corporation, Mangalore have obtained CFE for establishment of the 20 TPD C&D Waste processing unit at Pachanady on 30.12.2020.

### Conditions stipulated in CFE

While issuing CFE to Construction Project Condition regarding C & D Waste Management is being incorporated.

- (A) Annual Returns as required under the C & D Waste Management Rules, 2016.

###

**Format (D) for Compliance of Hazardous & Other Waste (Management and Transboundary Movement) Rules, 2016**

1. All the Chief Secretary of the all States/Uts have to provide compliance status report on implementation of recommendations made by Monitoring Committee in its interim report as well as final report to monitor of provisions of Hazardous & Other Waste (Management and Transboundary Movement) Rules, 2016 in compliance with Hon'ble Tribunals orders dated 12.04.2019 and 26.08.2019 in O.A. No. 804/2017 in the matter of Rajiv Narayan & Anr. Vs. Union of India & Ors. (copies of Hon'ble NGT orders enclosed), as per the following format;

Sl.No.	Directions of Hon'ble Tribunal in O.A. No.804/2017	Action plan along with time line for implementation of orders of Hon'ble Tribunal	Current Status of implementation	Gaps identified for implementing the directions of Hon'ble Tribunal	Details of state level committee constituted for the purpose of compliance of Howm rules, 2016
1	Wide orders dated 12.04.2019 Hon'ble NGT directed that "Having regard to the sensitiveness of the issue and impact of noncompliance on environment and public health, the above recommendations need to be fully implemented and monitored by the chief Secretaries at State Level.	The status of contaminated sites/probable contaminated sites is enclosed as Annexure-1. The remediation of the contaminated site in the premises of M/s Federal Mogul is under progress. For the Peenya Industrial Area, NGRI has conducted the study.	10%	90%	At present for supervision of hazardous waste management projects, a Steering Committee is constituted by the Govt. vide order No. FEE 146 ENV 2008, dt. 08.09.2014. The same Committee is being entrusted with the responsibility of supervision of action taken regarding the recommendations of the Monitoring Committee of CPCB and the directions of this Hon'ble Tribunal.
		Inventorisation of hazardous and other wastes	100%	0% (prepared and submitted to CPCB for period ending 31.3.2020) On going process	Complied

	Grant and renewal of authorisation	100%	0% No gap	Complied
	Examining the applications for imports submitted by the importers and forwarding the same to Ministry of Environment, Forest and Climate Change	100%	0% No gap	Complied
	Uniform format for visits and inspections of HW handling facilities is necessary to ensure comprehensive inspections as per the provisions of the Rules.	100%	0% No gap	Complied
	The authorization document should clearly stipulate respective mode of management (such as common or captive incineration / secured landfilling or pre-processing or recycling or utilization or export or captive storage, as applicable) for each category of HW being generated.	100%	0% No gap	Complied
	SPCBs/PCCs shall conduct environmental audit including the site selection criteria, design and layout for the TSDFs in next one year. They can engage expert institutes for the purpose and seek CPCB's technical advice on the ToR of the study, if required.	100%	0% No gap	Complied
	All the Common SLF shall disclose the mandatory amount deposited in Escrow Account annually to SPCB/PCC, CPCB and display on their website. SPCB/PCC to take action in case of non-compliance	100%	0% No gap	Complied
	Capacity building of Officers ( All the technical officers have giving training in implementation of Rules)	100%	50%.All the Technical Staff will be specially trained in the field by 31.12.2021	31.12.2021

<p>2 Vide orders dated 26.08.2019 Hon'ble NGT directed that All the Chief Secretaries of the States/Uts may be directed to submit biannually compliance report to CPCB by collecting information from the State Government/Departments like Labour/Industries/Environment and SPCBs/PCCs.</p>		<p>100%</p>		<p>Will be collected and submitted to CPCB.</p>
<p>3 Vide orders dated 26.08.2019 Hon'ble NGT has directed the Chief Secretaries of States to ensure effective and urgent implementation of the provisions of the rules as stipulated under Rule 5(2) of HOWM Rules, 2016 by the labour department.</p>		<p>100%</p>		<p>KSPCB has addressed letter to ACS and Principal Secretary, Department of Forest, Environment and Ecology, to ensure effective implementation of Rules on 20.06.2019. Letter has been addressed by KSPCB to Dept. of Labour.</p>

\* Please provide, Name and designation of designated officers for ensuring compliance to provisions of Hazardous & Other Waste (Management and Transboundary Movement) Rules, 2016.



**Details of contaminated /probable contaminated sites of Karnataka**

Sl. No	Site ID	Site Name and Address	GPS Coordinates	Land Use	Name of the Polluter (s)	Chemical of concern (CoCs)	Status report submitted before Hon'ble NGT CS/P/CS	Action Taken	Action proposed
1	KA-560-16	Peenya Industrial Area, IIIrd Phase, Bengaluru - 560 058	13.035 77.5226	Industrial	Not Known	Zinc, Chromium, Lead	PCS	The GPS reading falls inside an industry by name M/s Blyar Rubbers Pvt Ltd., Plot No. 212, 3rd Phase, Peenya Industrial Area, Bangalore. This is a Orange category industry engaged in manufacture of Tyre retreading material. The main raw material used are Natural rubber, Synthetic rubber, Carbon black, Rubber processing oil and chemicals. The industry is not using any raw materials which generates zinc, chromium or lead as waste. There is no contamination at the said site. However, outside the said industry, at a distance of about 50 m, in the 1st Main Road, mixed solid waste (mostly construction & demolition waste, domestic garbage, industrial garbage & other wastes) of about 50-100 Tons has been dumped all along the road in a stretch of about 200 m. A letter is addressed to the BBMP to clear the solid waste dumped at the said site. Board will regularly inspect the site.	It is recommended to delete this site from the list of probable contaminated site.
2	KA-560-17	Peenya Industrial Estate, IIIrd Stage, Bengaluru - 560 058	13.0195 77.4984	Industrial	Not Known	Lead, Zinc, Copper, Cadmium, Hexavalent, Chromium,	PCS	As per the GPS readings, the location falls behind M/s. Sain Coating Pvt. Ltd., Shed No. A-25 & 26, III Stage, PIE, Bengaluru (West side). The said industry is engaged in powder coating with pre-treatment activity. The effluent is being disposed to CETP and records submitted. The other industries surrounding the said location are as follows; East side - 2M Engineering & Sri Ramakrishna Dairy (Green category industries) North side - Service road followed by Main Road South side - Main Road. There is no contamination found at the said location and there are no industries in the surrounding area using raw materials of Contaminants of Concern (CoCs).	It is recommended to delete this site from the list of probable contaminated site.
3	KA-560-9	Peenya Industrial Area, Bengaluru - 560 058	13.0255 77.525	Industrial, Habitation settlement	Peenya Industrial area, Bangalore	Zinc, Chromium, Lead	CS	As per the GPS readings, the location falls behind M/s. Paragon Polymer Products Pvt. Ltd., Shed No. B-69, 2nd Cross, 1st Stage, PIE, Bengaluru (Green category) (East side). The other industries surrounding the said location are as follows; West side - M/s. Future Technologies M/s. AS Tech & M/s. Innovative Engg Equipments (All Green category units). South side - Main Road North side - Main Road. There is no contamination found at the said location and there are no industries in the surrounding area using raw materials of Contaminants of Concern (CoCs).	It is recommended to delete this site from the list of contaminated site.
4	KA-560-18	Peenya Industrial Area, 1st Phase, Bengaluru - 560 058	13.0384 77.5261	Industrial	Peenya Industrial area, Bangalore	Lead, Zinc, Copper, Cadmium, Hexavalent, Chromium,	PCS	As per the GPS readings, M/s. Triveni Engineering industry (Green Category unit carrying out engineering activity) is existing and the borewell water sample analysis indicates that Lead, Zinc, Copper, Cadmium, Hexavalent Chromium, Chromium, Nickel are with in the standards.	It is recommended to delete this site from the list of probable contaminated site.
5	KA-560-2	Goripalya near Mysore Road, Bangalore, Karnataka E-waste recycling in Bangalore	12.9641 77.5566	Habitation settlement	Informal E-Waste recycling units	Cadmium, Lead, Mercury, Zinc, Chromium, Arsenic, Copper	CS	Earlier municipal solid waste was dumped in the open space. BBMP authorities have cleared the waste and sent solid waste to their solid waste landfill site for further treatment and disposal. At present there is no dumping of solid waste. Hence, no further action is required.	It is recommended to delete this site from the list of contaminated site.

6	KA-560-6 city	12.945	77.585	Water Bodies	BBMP, BDA,PWD, MI, CMC and Panchayath, Tourism Dept.	Lead	PCS	<p>The lake is located within Lalbagh garden and there is no industries closed by, a part of the sewage generated from Jayanagar 2nd block residential area was entering into the lake due to the leakage of manhole provided to the sewer line which is passing adjacent to the lake. BWSSB authorities have replaced and reconstructed manhole and diverted all the sewage into their sewer network. Now, there is no entry of any sewage into the lake. Board is monitoring the lake regularly. The analysis reports for the last 4 years reveals that there is no presence of lead in the lake water except during the year 2018 i.e., 0.001 mg/l (copy of the compiled result data sheet is herewith enclosed for reference). Hence, no further action is required</p>	It is recommended to delete this site from the list of probable contaminated site.
7	KA-560-14	12.9965	77.6109	Industrial	Escort Group	Chromium VI, Chromium Total	PCS	<p>The Escorts Group is one of the Indian Automotive components manufacturing companies which were operating in Yelahanka, Bengaluru since 1977 involving in the manufacturing of automotive components such as Piston, Piston Rings and Pins. The Chrome plating is one of the process involved in the manufacturing of the Piston Rings. The Escorts group was storing spent chromic acid in an RCC lined underground tank, which generates from the Chrome plating operation. As, chromic acid is corrosive and highly acidic in nature, the underground RCC tank which was used for storing of spent chromic acid started leaking and slowly caused underground water contamination in and around the industry. The Escorts Group had sold the above said manufacturing unit to Federal Mogul Goetze India Ltd, in the year 2016. Subsequently, The Board noticed ground water contamination in few wells in and around the industry and imposed strict direction on the company for Ground water Remediation. The Federal Mogul has implemented effective ground water remediation program by the involving American based consultants. Federal Mogul also involved National Geo-physical Research Institute(NGRI) as per the direction of Karnataka State Pollution Control Board for ground water modelling to understand the extent of contamination and the year from which the ground water contamination started. The ground water in and around the industry was jointly monitored by Federal Mogul, University of Agricultural Sciences, Bangalore since 2010 and many recommendations were given both by the NGRI and University of Agricultural sciences towards the remediation. The quality of ground water was monitored on quarterly basis and now it is monitored at six monthly intervals. Based on various scientific studies conducted by Federal Mogul and as per the advice of NGRI, Federal Mogul adopted United State Environmental Protection Agency (USEPA) approved remediation process such as Ex-situ and In-situ treatment. The Ex-situ treatment is the remediation methodology where the ground water is being pumped out /extracted from the ground to create hydraulic capture/ avoid off-site migration and treated in a automated chrome water treatment plant followed by excavation of highly contaminated soil and off- site treatment at TSDF facility. Similarly, In-situ treatment is the injection of reductants directly in to the soil and ground water for treatment of Hexavalent chromium at the contaminated source itself. The Federal Mogul also shifted the old plating operation in order to facilitate the remediation activity to a new location where the scientific impervious floor lining is done to eliminate any possibilities of soil or ground water contamination in treatment. The Ground water remediation is still going on .</p>	Remediation action is under progress.
8	Hebbal Lake, Bangalore, Karnataka-560024	13.0462	77.5858	Water bodies	Forest Department, Minor Irrigation Department, Horticulture Department, Public Works Department(PWD), Bangalore Mahanagara	Lead	PCS	<p>Hebbal Lake is located in the north of Bangalore and at the mouth of National Highway 7, at the junction of Bellary road and the outer ring road(ORR). It was one of the three lakes created in the year 1537 by Kempegowda, like most lakes or "tanks" in the Bangalore region it was formed by the damming natural valley systems by the construction of bunds. The catchment area of the lake includes the residential areas of Yeshwanthpur, Mathikere, Rajmahal Vilas Extension, Bharat Electronics Limited and Hindustan Machine Tools Limited colonies. In the late 1990s, an ecological experiment was conducted with the introduction of Neochetina. A project for lake restoration funded under the Indo-Norwegian Environment Programme led to major changes in the ecosystem beginning in 1998, two artificial islands were created using the soil from delisting under this project. In 2004, the LDA began a process of "public-private participation" where private companies bid for the lakes to "develop and maintain" them for the next 15years. The Hebbal, lake is leased for 15years to M/s. East India Hotels Ltd for maintenance. Specific</p>	It is recommended to delete this site from the list of probable contaminated site.



12	KA-560-8	Mangamnapalya Road, Mangamnapalya Village, Hosur Road, Bengaluru, Karnataka-560030	12.9029	77.632	Water bodies	Habitat, Settlement, Commercial and industrial	Lead	CS	The co-ordinates mentioned were verified and it pertains to Hosur Road, i.e., NH-7 (Chennai-Bengaluru Highway) and fly over road to Electronics City. The road and fly over is developed and is under use. However the sample collected from Mangamnapalya Lake reveals that the parameters are conforming to Class D standards.	It is recommended to delete this site from the list of contaminated site.
13	KA-560-7	Madiwala Lake, BTM 2nd Stage, Bengaluru, Karnataka-560076	12.5417	77.3649	Water bodies	Not Known	Lead	PCS	KSPCB is regularly monitoring water and sediment quality of Madiwala Lake. TAs per the Analysis report Lead concentration in lake water sample is BDL for the January 2020 but water quality shows class D. Sediment sample of lake having lead concentration 22.1 mg/Kg. The level of lead concentration in sediment are below the concentration limit of Hazardous (> 5000 mg/Kg).	It is recommended to delete this site from the list of probable contaminated site.
14	KA-560-3	Bellandur Lake, Bellandur Village, Bengaluru, Karnataka - 560103	12.927	77.668	Water bodies	Forest Dept, Hort Dept, BDA, BBMP, PWD, MI, CMC & Panchayath, Tourism Dept.	Cadmium	PCS	KSPCB is regularly monitoring water and sediment quality of Bellandur Lake. As per the Analysis report, there are no traces of Cadmium concentration in lake water sample but water quality shows class E. & sediment sample. The level of cadmium concentration in water shows class E. Sediment sample of lake having lead concentration 16 mg/Kg. The level of cadmium concentration in sediment samples are below the concentration limit of Hazardous (> 50 mg/Kg).	The Board has advised BDA to carry out detailed analysis of sludge to ascertain whether it is hazardous in nature.
15	KA-560-4	Arekere Lake, Arekere Village, Bengaluru, Karnataka-560076	12.57	77.374	Water bodies	Forest Dept, Hort Dept, BDA, BBMP, PWD, MI, CMC & Panchayath, Tourism Dept.	Lead	PCS	KSPCB is regularly monitoring water quality of Arekere Lake. As per the Analysis report Lead concentration in lake water sample is BDL for the January 2020 but water quality shows class E. Sediment sample of lake having lead concentration 12 mg/Kg. The level of lead concentration in sediment are below the concentration limit of Hazardous (> 5000 mg/Kg).	It is recommended to delete this site from the list of probable contaminated site.
16	KA-560-1	Agara lake, Bengaluru City, Karnataka-560102	12.5511	77.3834	Water bodies	Forest Dept, Hort Dept, BDA, BBMP, PWD, MI, CMC & Panchayath, Tourism Dept.	Lead	PCS	KSPCB is regularly monitoring water quality of Agara Lake. This lake is rejuvenated by Karnataka Lake Conservation and Development Authority. As per the analysis report of the lake water after rejuvenation lead concentration is BDL (Jan-2020). Sediment sample of lake having lead concentration 16 mg/kg. The level of lead concentration in water whos class D standards & sediment samples are below the concentration limit of Hazardous (>5000 mg/kg)	It is recommended to delete this site from the list of probable contaminated site.
17	KA-560-12	Begur Lake, Begur Road, Bengaluru, Karnataka-560068	12.5339	77.3713	Water bodies	Not Known	Chromium, Lead, Iron, Zinc, Nickel, Copper	PCS	KSPCB is regularly monitoring water quality of Begur Lake. As per the Analysis reports, the level of said parameters' concentration in water shows class D standards. sediment sample of lake is having having metal concentration are below the permissible limit of Hazardous except for Zinc 20000 mg/ Kg, Chromium, copper, Lead and nickle -5000 mg/Kg. However, there is no Standard stipulated for Iron.	Samples at various points in the lake will be collected based on the analysis reports further action will be taken.
18	KA-581-581325	Dandeli, Karnataka-581325	15.238	74.6151	Water Bodies	West Coast Paper Mills Ltd,	Dioxins	PCS	The GPS Co-ordinates is showing as Urdu School which is more than 1 Km Upstream of M/s. West Coast Paper Mills Ltd. However, the polluter is mentioned as M/s. West Coast Paper Mill Ltd. The industry was using elemental chiprine until 2009 and this activity might have possibly resulted in Bio-accumulation in the surrounding environment including Water, Soil, Sediments, Sludge, Flora and Fauna around the said industry for the presence of dioxin in an obnoxious level.	The analysis of dioxin will be carried out and based on the results further action will be taken.
19	KA-570-2	Metagalli Industrial Area, Mysore city, Karnataka, India - 570 016 (Mys Urban)	12.3601	76.6326	Industrial	Not Known	Not Known	PCS	Presently the site ID KA-570-2 is utilized by Geetha Sishushikshana Education Trust (Engineering College). As per the records, earlier in the said site M/s. Vasavi Soft drinks (P) Ltd., was in operation & engaged in manufacturing of bakers yeast activity. The unit was closed and new Engineering college has been established & operating at the said site	It is recommended to delete this site from the list of probable contaminated site.
20	KA-571-	Cauvery River,	12.14	76.6757	Water	Not Known	Lead,	CS	No such Contamination of lead has been observed and there are no industries/ activities engage in the discharge of	CMC Nanjangud has been





**Format (E) for seeking information w.r.t. Compliance to E-Waste Rules.**

In the present OA 512/2018 (Shailesh Singh Vs. State of Uttar Pradesh) filed before Hon'ble NGT, Principal Bench, N-Delhi the issue under consideration is management of e-Waste consistent with the E-waste (Management) Rules, 2016. The grievance in this application is against unauthorized recycling/collection/dismantling units, burning and selling of e-waste and unscientific disposal of e-waste in violation of the Rules causing contamination of ground water, air pollution and soil acidification.

In the compliance with the directions of the Hon'ble NGT, CPCB prepared an action plan for enforcement of E-Waste(M) Rules, 2016. The Stakeholders responsible for implementation of the said action plan included, CPCB, SPCBs/PCCs, Custom department, Ministry of commerce, Ministry of electronics \* telecommunication & District Administration of all the States. CPCB has also written to the PS to Chief Secretaries for the compliance of the action plan and requested for submission of Action Taken Report (ATR). Only few State Governments (District Administration) have responded so far.

CPCB may again write to all the Chief Secretaries seeking information w.r.t to compliance of E-Waste Rules in their respective States. The format for seeking information is as below:

S.No.	Challenges Activities	Stake holder responsible for implementation	Action	Current Status	Desirable level of compliance in terms of statuses	Gap between current status & desired level	Proposal for attending the gap with timeliness	Name, designation, contact number, of designated officer for ensuring compliance to the provisions under statute
a.	Checking of informal trading, dismantling and recycling of waste	SPCBs / PCCs/ District Administration	SPCBs/Pccs n coordination with District Administration has to carry out quarterly drive for checking of this activity.	There are 152 Nos of E-waste Dismantling, recycling and refurbishing units in the Karnataka, of which 89 units are in operation, 26 units have been closed and 30 units are Yet to Commission and 08 units are not working.	100%	75%	31.12.2021 (The Proposal is as per Annexure -1)	Member Secretary, KSPCB, Bangalore Senior Environmental Officer, Waste Management Cell, KSPCB., Bangalore
b.	Facilitate collection and disposal of e-waste	SPCBs / PCCs/ District Administration/CPCB	State Government to formulate mechanism for collection and for incentivizing setting up of recycling facilities.	State Government to formulate mechanism for many informal sectors, now converted to formal section. As per the E-waste Management Rules only Producer, PRO's, Processors of E-waste can open collection centers. In Karnataka there are 66 Nos of collection center opened ( based on the information given by CPCB). Since Karnataka is having adequate number of E-waste processing units, there is no necessity of giving incentives to recycling units.	100%	85%	31.12.2021 (The Proposal is as per Annexure -1)	Member Secretary, KSPCB, Bangalore Senior Environmental Officer, Waste Management Cell, KSPCB., Bangalore

c.	Governance frame work for monitoring compliance	SPCBs / PCCs/ District Administration/CPCB	Monitoring to be ensured at city/district and state levels for which nodal officers (State Environmental Secretary, District Collector, CMD/ Commissioners) to be designated. Time frame - Three (3) months.		100%	100%	31.12.2021	Member Secretary, KSPCB, Bangalore Senior Environmental Officer, Waste Management Cell, KSPCB, Bangalore
d.	Capacity building at district/State/CPCB level	SPCBs / PCCs/ District Administration/CPCB	Special workshops to educate functionaries in Government / NGOs be run over one year	The KSPCB will request the State Government on the matter	100%	Few Awareness programs have been held	31.12.2021	Member Secretary, KSPCB, Bangalore Senior Environmental Officer, Waste Management Cell, KSPCB, Bangalore
e.	IEC plan be firmed up and executed	SPCBs / PCCs/ District Administration/CPCB	State Government to firm up IEC plan for educating public at large about the system of collection, incentive structure and facilities for recycling. Time frame - Three (3) months. The IEC plan to be executed over on year.	The KSPCB will request the State Government on the matter.	100%	100%	31.12.2021	Member Secretary, KSPCB, Bangalore Senior Environmental Officer, Waste Management Cell, KSPCB, Bangalore
f.	Strengthen system of enforcement	SPCBs/PCCs/ District Administration CPCB	quarterly review of violation and enforcement actions at City/District/State level and quarterly reports to be filed with CPCB.	District level Committees to monitor OA No. 606 will be asked to monitor implementation. However, KSPCB is regularly monitoring	100%	0%	Complied	

## ANNEXURE-I

### Gaps in the Management of EoL EEE Products

E-waste generation is growing at an exponential pace. It is of critical importance that we create a robust collection infrastructure that will allow waste to flow in for responsible recycling. A wide, easily accessible and mature collection network is at the core of a healthy e-waste ecosystem and is essential to achieve the goals. Lack of easy mechanism and system for citizens, ULBs, consumer industry & organisations to channelize to correct destination, lead to the situation where citizens, ULBs and other organisations sell their e-waste to kabadiwalas (because of their easy access) or discard it, leading to increase of flow of e-waste to informal players and related pollution.

As per the data available Karnataka is generating around 80,821 Metric Tons of e Waste and collected only 11,690 MT for recycling during 2019. There is a huge gap between the generation and collected for recycling. In order to address the above gap, following are some of the recommendations to improve the management of e waste.

### Recommendations :

- All the e-Waste collected by ULBs should be channelised to PROs/ authorised e-waste recyclers. If ULBs are not collecting e-waste, they should be encouraged to tie up with PRO, recycler and ensure that e-waste is collected from household and provided to the PRO, recycler with proper documentation.
- The existing collection network is dominated by the informal sector. The role of informal sector needs to be acknowledged, and a platform should be created for registration of informal sectors and formalizing them. This will allow rapid expansion of the collection infrastructure that would create a win-win situation for the informal sector as well as create a sustainable e-waste management system across the country.
- Arrangements should be made to register all those who are collecting any type of e-waste in the informal/formal market on a central platform with digital presence as well to ensure accessibility and ease. A system is required to be introduced to track the movement of e-waste. At all times, e-waste should be traceable for its origin, and its particular coordinates in the transaction.
- Create digital infrastructure for channelisation of e-waste from all Citizens, Producers, Bulk consumers, ULBs to recyclers and this should be made mandatory for all government offices, public sectors organisations, and consumer companies.
- Develop guiding price range for bulk consumers to sell their e-waste to only authorised recyclers to reduce the price gap between formal and informal transactions.
- Bring online auctioning platforms that are dealing with e-waste as scrap material under the purview of the E-waste (Management) Rules and systems are put in place such that they are connected to PROs, recyclers and digital platforms who are authorised to collect as per E-waste Rules.
- Bulk consumers should be made responsible for the e-waste generated by them until EOL of the product with or without association of recyclers.

- There is no inventory data available at state level on e-waste generation rates. Government should define standardized methodology for inventorisation and a standard ToR which can be used by SPCBs to conduct this exercise.
- Develop standard formats for recyclers for reporting Certificate of Destruction and Mass Balance (MBR) Reports and provisions should be put in place for strict monitoring of recyclers.
- The current EPR policy has set a target for collection between 30% to 70 % of the EEE put into market. To encourage the compliance towards present EPR collection targets, system of partial lease ranging from 25% to 50% should be recommended instead of complete ownership of the EEE products in the EPR targets.

  
**Senior Environmental Officer**  
**Waste Management Cell**

Status of CETPs/ ETPs including performance

Sl. No.	Thematic area	Current Status	Desirable level	Gap between current status and desired levels	Time lines for attending gaps	Name and designation of the Designated Officer for ensuring compliance
						Member Secretary, KSPCB, Bangalore Senior Environmental Officer, Waste Management Cell, KSPCB, Bangalore
	Status of CETPs/ ETPs including performance	In Order to monitor any illegal discharges from the CETPs following are the action plan				
		1. GPS enabled vehicles are required to be used for transportation of effluents from the industry to CETP	100%	0% ( No gap )	Complied	
		2. Only Board authorised vehicles shall be used for transportation of effluents from the industry to CETP	100%	0% ( No gap )	Complied	
		3. Uploading of authorized vehicles to the Board website.	100%	0% ( No gap )	Complied	
		4. Online generation of manifest system	100%	0% ( Soft ware ready, trials conducted )	Complied	
		5. GPS enabled Vehicle tracking system	100%	0%	Complied	
		6. Colour coding for transportation vehicles	100%	0%	Complied	

					31.12.2021	
	7. Establishment of Common Effluent Treatment Plant at Urban Eco Park, Peenya of Capacity 200 KLD  The establishment of CETP at Peenya will cater the needs of Peenya and surrounding areas most of the areas are coming under the catchment of V-Valley also. This will reduce the transportation distance.  The State Government has sanctioned Rs. 10 Crores for establishment of CETP	100%	100% ( Tender to be called on boot basis for revised proposal of 125 KLD)			
	Fixing of inlet standards to CETP	100%	0%		Complied	
	Display of Inlet standards in the Board website	100%	0%		Complied	

**Format (J) for Noise Pollution in Respect of Bangalore Metropolitan City**

Sl.No	CONTENT	CURRENT STATUS	DESIRABLE in %	GAP in %	TIME LINE	Name and designation of the Designated Officer for ensuring compliance
1	No. of stations for ambient Noise Monitoring	10				As per Rules
2	No. of Stations in Industrial Zone	2				
3	No. of Stations in Commercial Zone	3				
4	No. of Stations in Residential Zone	3				
5	No. of Stations in Silence Zone	2				
6	Compliance of Ambient Standards (No. of Stations)	Status of online Ambient Noise monitoring results of 10 stations for the Year 2019-20 is as under.				
	Industrial Zone		75 dB (A) Leq (Day) 70 dB (A) Leq (Night)	Varying between 27.5 to 81.8 dB (A) Leq during day Varying between 48.9 to 74.6 dB(A) Leq during night	Not Complied	
	Commercial Zone		65 dB (A) Leq (Day) 55 dB (A) Leq (Night)	Varying between 28.7 to 94.5 dB (A) Leq during day	Not Complied	

Not Complied

				Varying between 50.0 to 86.0 dB (A) Leq during night	Not Complied	
Residential Zone			55 dB (A) Leq (Day) 45 dB (A) Leq (Night)	Varying between 27.8 to 98.4 dB (A) Leq during day	Not Complied	
				Varying between 36.3 to 99.8 dB (A) Leq during night		
Silence Zone			50 dB (A) Leq (Day) 40 dB (A) Leq (Night)	Varying between 25.8 to 96.8 dB (A) Leq during day	Not Complied	
				Varying between 37.8 to 88.3 dB (A) Leq during night		
7	Identification of Hot Spots					
8	Designated Authorities defined as per Noise Rules (Y/N) (Details to be provided)		Yes.			Police Commissioner and Officers not belongs the rank of Deputy Superintendet of Police

9	Has Methodology been prepared for granting permission for installation of Public Address System? (Y/N) (Details to be provide)	Local Bodies and Police are granting permission for installation of public address system.	-	-	Complied	
10	Has Methodology been prepared for redressal of complaint on noise pollution? (Y/N) (Details to be provide)	Yes. For redressal of complaint on Noise Pollution methodology is being followed. The Web based software has been developed and dedicated short code help line No. 10741 is allotted by Ministry of Communication and Information Technology, Department of telecommunications	-	-	Complied	
11	No. of Police Stations equipped with sound level meter	108 Police stations ( Law & Order) have been provided 108 Noise/ Sound level meters by KSPCB as per Govt. of Karnataka order).	-	-	Complied	
12	No. of Police Stations having officers trained as per Noise Pollution Rules by SPCBs/PCs.	The KSPCB has conducted training programme for Police personnel on 6.11.2019. (108 Police Stations)	-	-	On going	
13	Has Protocol been developed for taking appropriate action against the defaulters?	As per CPCB directions dated 27.04.2021 on scale of compensation for violations of Noise Rules, 2000 issued under Section of the E(P) Act, 1986 to the designated authorities in the State have been directed to comply.	-	-	-	
14	No. of cities in which Noise Mapping has been done (if applicable)		-	-		



**Format (E) for seeking information w.r.t. Compliance to E-Waste Rules.**

In the present OA 512/2018 (Shailesh Singh Vs. State of Uttar Pradesh) filed before Hon'ble NGT, Principal Bench, N-Delhi the issue under consideration is management of e-Waste consistent with the E-Waste (Management) Rules, 2016. The grievance in this application is against unauthorized recycling/collection/dismantling units, burning and selling of e-waste and unscientific disposal of e-waste in violation of the Rules causing contamination of ground water, air pollution and soil acidification.

In the compliance with the directions of the Hon'ble NGT, CPCB prepared an action plan for enforcement of E-Waste(M) Rules, 2016. The Stakeholders responsible for implementation of the said action plan included, CPB, SPCBs/PCCs, Custom department, Ministry of commerce, Ministry of electronics \* telecommunication & District Administration of all the States. CPB has also written to the PS to Chief Secretaries for the compliance of the action plan and requested for submission of Action Taken Report (ATR). Only few State Governments (District Administration) have responded so far.

CPCB may again write to all the Chief Secretaries seeking information w.r.t to compliance of E-Waste Rules in their respective States. The format for seeking information is as below:

Sl.No.	Challenges Activities	Stake holder responsible for implementation	Action	Current Status	Desirable level of compliance in terms of statuses	Gap between current status & desired level	Proposal for attending the gap with timelines	Name, designation, contact number, of designated officer for ensuring compliance to the provisions under statute
a.	Checking of informal trading, dismantling and recycling of waste	SPCBs / PCCs/ District Administration	SPCBs/Pccs n coordination with District Administration has to carry out quarterly drive for checking of this activity.	There are 146 Nos of E-waste Dismantling, recycling and refurbishing units in the Karnataka, of which 87 units are in operation, 26 units have been closed and 26 units are Yet to Commission and 08 units are not working.	100%	75%	30.06.2021	Sri Natesh Environmental Officer, Waste Management Cell
b.	Facilitate collection and disposal of e-waste	SPCBs / PCCs/ District Administration/CPCB	State Government to formulate mechanism for collection and for incentivizing setting up of recycling facilities.	State Government to formulate mechanism for many informal sectors, now converted to formal section. As per the E-waste Management Rules only Producer, PRO's, Processors of E-waste can open collection centers. In Karnataka there are 66 Nos of collection center opened (based on the information given by CPB). Since Karnataka is having adequate number of E-waste processing units, there is no necessity of giving incentives to recycling units.	100%	0%	Complied	Sri Natesh Environmental Officer, Waste Management Cell



**Compliance to Status of STPs & re-use of treated water – 12-07-2021**

**NGT Order in OA 606  
dated:12.09.2019 &  
07.01.2020**

**Implementation status**

1      2      3      4

**Compliance to duties of waste generators**

Sl. No		Current Status (Compliance as on till date)	Desirable Level of Compliance in terms of statutes	Gap Between current status and desired levels	Proposal of attending the gap with time lines	Name and designation of designated officer for ensuring compliance to provisions under statute (Commissioner/ Director) with Mobile No.
1	Status of (a) STPs & (As on 12-07-2021)	(a) BWSSB is having STPs with a total capacity of <b>1372.5 MLD.</b>  Presently, 03 STPs with total capacity of 161 MLD are under construction at different locations of the city making the total treatment capacity 1533.5 by 2021	<b>100%</b>	<b>4.69%</b>	<b>30.09.2021</b>	
	b) Re-use of treated water (As on 12-07-2021)	(b) 914.78 MLD of sewage is being treated out of which <b>561.68 MLD</b> of Treated water from different STP/TTPs is being utilised for various purposes like rejuvenating/recharging of Lakes Gardening, Industrial applications,	<b>100%</b>	<b>38.60%</b>	149.10 MLD (16.30%) gap is expected to be achieved by end of December 2022	

		<p>construction purposes etc. Detailed statement is enclosed as <b>Annexure-1</b> At present 561.68 MLD is being utilised. Balance treated quantity will be taken Kaveri Neeravari Nigama Ltd (KNNL)-120 MLD to Ramanagara District Lakes, Minor Irrigation Department-90 MLD to Kolar District, KPCL Yelahanka plant - 15 MLD, KIADB-40MLD to Narasapura. Also KPCL, Bidadi are requesting for 1 MLD from V. Valley To recharge/tap up the nearby lakes in the city.</p>				<p>204 MLD (21.74%) gap is expected to be achieved by end of December 2023</p>
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 CE(WWM)  
 BWSSB  
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**Ongoing STP works**

Sl. No.	ULB name	STP capacity (MLD)	STP capacity Status as on 01/03/2021	STP capacity Status as on 14/07/2021	Incremental progress (against column 4 and 5)	Reason for no change in status (reasons to be indicated)	Proposed actions to improve progress	Is the Consent letter from KSPCB obtained. If Yes, letter no. and date	Physical Progress of whole project in %		Financial Progress of whole project in %		Anticipated Date of completion of work	Remarks
									Upto Jan, 21	Upto Jun, 21	Upto Jan, 21	Upto Jun, 21		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Maddur	3.50 MLD (Upgradation of existing 3.50 MLD STP WSP to 6 MLD capacity using Extended type Aeration)	STP-Anerobic pond excavation completed.	STP Pond- formation of bund completed	about 45% progress	Work in progress	Instructed the agency to expedite the progress		12%	45%	10%	40%	31.12.21	Work in progress
2	Madikeri	4.5 MLD SBT	Out of 4.78 Acres 1.7 Acres of land has been handed over to the Board.	Earthwork excavation of STP is under progress	10%	Due to heavy rain in this region, progress of work is hampered.	Instructed the agency to expedite the progress	Yes, Letter No.: 248 Dated: 01/06/2012	0%	10%	0%	0%	Oct-22	At present work is stopped due to heavy rain from May-2021
3	Kushalnagar	6.5 MLD SBT	Designs are approved	Earthwork excavation of STP is under progress	15%	Due to heavy rain in this region, progress of work is hampered	Instructed the agency to expedite the progress	Yes, Letter No.: 854 dated 14/12/2017	0%	15%	0%	10%	Jan-22	
4	Periyapatna	4.2 MLD SBR	Designs are approved	Work to be taken up		Technology has been changed from Aereated lagoon to SBR Technology for which variation has been submitted to Board for approval.		Environmental Officer KSPCB has given a letter vide no: 1478 dt: 26-2-2019 to change the old technology of Aerated lagoon to modern technology. Accordignly the construction of SBR type STP to be taken up. Proposal for cosent is to be submitted for construction of STP.					31-03-2022	
5	Sindagi	7.37	Hydraulic Design & Drawings are to be submitted by the Agency for Approval.	Structural Design & Drawings are yet to be submitted by the agency for approval.		After approval of the structural design & drawings from the competent authority work will be taken up			0	0	0	0	02.12.2022	Hydraulic Design and drawings Approved on 17.06.2021 and Structural Design and Drawings yet to be submitted by the Agency. Boundaries are fixed and Jungle Clearance work have been taken up.
6	B.Bagewadi (UGD to Leftout Areas)	0.25 ( Savalahalla Tanda)	Civil work under progress	Civil Works Completed and Electromechanical Works is under Progress.	30%	---	---	Yes Online PCB ID No. 87266 Date:20.06.2020	0	30	0	0	31.08.2021	The land for Construction of 0.25 MLD MBBR Technology is handed over by ULB on 17.02.2021.  June 2021: Civil works completed and Procurement of Electromechanical Components under progress. All the works will be completed and commissioned on 31.08.2021.
7	Muddebihal STP	5.24	Civil works completed.	Electro Mechanical works are under progress.	40%	---	---	Yes Letter No: 614 Date:30.11.2018	20	40	15	38.46	31.08.2021	June 2021: Civil works completed and electromechanical works under progress. All the works will be completed

Sl. No.	ULB name	STP capacity (MLD)	STP capacity Status as on 01/03/2021	STP capacity Status as on 14/07/2021	Incremental progress (against column 4 and 5)	Reason for no change in status (reasons to be indicated)	Proposed actions to improve progress	Is the Consent letter from KSPCB obtained. If Yes, letter no. and date	Physical Progress of whole project in %		Financial Progress of whole project in %		Anticipated Date of completion of work	Remarks
									Upto Jan, 21	Upto Jun, 21	Upto Jan, 21	Upto Jun, 21		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
8	Dandeli CMC	8 MLD	1. SBR Tank - Side wall, varying wall, launder & division box completed and Bypass chamber side wall, collection chamber side wall, Baffle walls casting is under progress. 2. Chlorine contact tank - Fully Completed. 3. Chlorine tonner room & Chlorination Building - Upto Plinth Level completed and further work in progress. 4. Air Blower, Admin, Lab, Scada room - Upto Lintel Level RCC work completed and brick work in progress. 5. MCC room, Metering room & HT room - Upto Lintel Level RCC work completed and brick work in progress.	1. SBR Tank - Fully completed except central walkway. 2. Chlorine contact tank - Fully Completed. 3. Chlorine tonner room & Chlorination Building - Roof slab completed 4. Air Blower, Admin, Lab, Scada room - 1st floor Roof slab completed 5. MCC room, Metering room & HT room - Roof slab completed, finishing works to be done. 6. DG room - columns upto lintel completed 7. Centrifuge Building - columns upto slab bottom completed. 8. PT unit - column footings completed.	12%	—	Work is in progress.	Applied for consent letter	50%	61%	44%	57%	5-7-2022	Work is in progress.
9		0.5 MLD	Hydraulic designs and drawings approved vide CE (DWD) letter No:1737 Dtd:08.02.2021. Agency has been instructed to submit the structural designs for approval.	Structural designs drawings approved on 07.05.2021. Presently excavation is completed.	2%	—	Work is in progress.						5-7-2022	Work is in progress.
10	Haliyal TMC	3.5	STP proposed to construct at Bablikere & local body was handed over 2 Acres 00 Guntha land at Sy. No 83. The private land identified for construction of approach road to STP has been not handed over, as the owners are not willing to sell their land for the value fixed by sub-registrar. In this context, a meeting was held on 15.09.2020 under the chairmanship of Hon'ble MLA, Haliyal - Joida & it has been directed to construct 3.5 MLD STP in forest land which is 3.5Km away from the Bablikere. Proposal for clearance of land from forest dept. is uploaded on Dtd:11.11.2019.PCCF Bengaluru has sought clarification vide letter Dtd:07.12.2020 and same is uploaded on 04.02.2021.DCF,Bengaluru has instructed to obtain compliance certificate in form II as per FRA act. Chief officer ,TMC Haliyal has requested DC,Karwar to issue the same vide letter dtd:03.02.2021. Further Site inspection from DFO,Haliyal office for forest stage1 clearance is awaited.	Hydraulic Designs are approved but due to non-availability of site for approach road work is not started. Alternate Forest Land at Hullatti is identified and proposal for land aquisition is taken up, presently Site inspection pending from DFO office for forest stage1 clearance. DFO,Haliyal inspected the site on 22 -06-2021 and presently the proposal is under verification at CCF Sirsi.	0%	Forest Clearance awaited.	Proposal for clearance of land from forest dept. is uploaded on Dtd:11.11.2019.PCCF Bengaluru has sought clarification vide letter Dtd:07.12.2020 and same is uploaded on 04.02.2021.DCF,Bengaluru has instructed to obtain compliance certificate in form II as per FRA act. Chief officer ,TMC Haliyal has requested DC,Karwar to issue the same vide letter dtd:03.02.2021. Further Site inspection from DFO,Haliyal office for forest stage1 clearance is awaited.		42%	52%	38%	49%	5-7-2022	Forest Clearance awaited.
11		0.75	Hydraulic designs and drawings are approved on 08.02.2021. Agency has been instructed to submit the structural designs for approval.	Structural designs & drawings are approved on 07.05.2021. Work is yet to be started.	0%	Structural design and drawings are to be got approved	Agency has been instructed to submit the structural designs for approval.						5-7-2022	Work is yet to be started.
12	Bhatkal TMC	3	Hydraulic designs and drawings are approved on 27.10.2020. Agency has been instructed to submit the structural designs for approval.	Structural design and drawings are approved. 3.00 MLD SBR Basin outlet wall 2nd lift concrete work completed on 29.06.2021. 1. SBR Basin 1st lift completed. Admin building: Plinth beam completed. PT Unit: Excavation is in progress. Sludge sump and sludge tank: wall completed. Centrifuge bluilding: Upto plinth level completed.	3.50%	—	Work is in progress.		1%	5%	7%	8%	9-7-2022	Work is in progress.
13		2.5	Land is to be handed over by TMC,Bhatkal	Land is to be handed over by TMC,Bhatkal	0	Land is to be handed over by TMC,Bhatkal	Letters and reminders are addressed to TMC , Bhatkal by Division Karwar dated 21.03.2021 & 09.04.2021						9-7-2022	

Sl. No.	ULB name	STP capacity (MLD)	STP capacity Status as on 01/03/2021	STP capacity Status as on 14/07/2021	Incremental progress (against column 4 and 5)	Reason for no change in status (reasons to be indicated)	Proposed actions to improve progress	Is the Consent letter from KSPCB obtained. If Yes, letter no. and date	Physical Progress of whole project in %		Financial Progress of whole project in %		Anticipated Date of completion of work	Remarks
									Upto Jan, 21	Upto Jun, 21	Upto Jan, 21	Upto Jun, 21		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
14	Kumta TMC	4.6	STP is proposed to construct at Shashihittal, Gund, Kumta . Application for consent for establishment (CFE) has been filed and clearance is sought from KSPCB.		0	Clearance from KSPCB & CRZ is awaited.	letter has been addressed to Environmental Officer,KSPCB Karwar vide Division Karwar letter No:190 Dtd:26.05.2021 to fix the date to give a technical presentation to competent authority of KSPCB and convince them that identified site for proposed 4.6 MLD STP at Kumta is feasible for construction of STP,	Clearance from KSPCB & CRZ is awaited.	62%	62%	60%	60%	31/05/2022	Clearance from KSPCB & CRZ is awaited.
15	Jali TP	3	Hydraulic designs and drawings are approved on 27.10.2020.Agency has been instructed to submit the structural designs for approval.	Structural design and drawings are approved. Admin Building excavation work completed. PCC work under progress.	2%	—	Work is in progress.		8%	18%	6%	15%	9-7-2022	Work is in progress.
16	Honnavar TP	2.6	structural design and drawings are approved.		0	Heavy rain.	—	Yes, Ltr no. 1131 Dtd: 24.09.2015	38%	39%	37%	38%	31/05/2022	
17		0.2	Public agitation. The issues were discussed with the President and the Vice President of ULB on 05.04.2021. and further they assured to solve public issues and clear the STP site.The work is hampered due to corona pandemic and further by heavy rain.		0	Public agitation.	—							
18	Belagavi	70	Raft for SBR basin and CCT were under progress.	a) Construction of Pre-Treatment Units : Soaling, PCC and Foundation Completed. Column work under progress. b) Construction of SBR Basins : Soaling and PCC for entire SBR Completed, Concreting of Raft for Basin 2,3 & 4 completed, Concreting of Vertical walls under progress. c) Construction of Chlorine Contact Tank : Foundation, Raft work completed. Vertical wall upto Floor Slab completed. Balance work under progress. d) Construction of Administrative cum Blower Building : Foundation completed. Columns upto Plinth level completed and Balance work under progress.	20%	Work under progress	—	Applied online on 04.12.2020 CFE is awaited	28%	30%	20%	28%	30.11.2021	Due to monsoon the work is slowed down.
19	Ramadurga	3.3	60% of work completed. 4.55 Kms of 250mm dia DI pipe supplied and 2.25 Km laid. Pumps and other accessories supplied.	a) Facultative Pond : No. 1 & 2 last layer of bund formation completed and Template work under progress. b) Anerobic Pond : Formation of Bund completed. Wet well & PT Unit : Pre treatment Unit near well completed. Wet well floor slab and Brick Masonry above floor Slab upto lintel level completed. Pumping Mahnole near Mini Vidhan Soudha : Upto 2.10 Mtrs completed (2.20 Mtrs Height)	18%	Work under progress	Instructions have been issued to the contractor to mobilise men and machinery to expedite the progress.	KSPCB Ltr. No. 179 Dtd : 11.05.2012	52%	60%	55%	57%	07.09.2021	
20		1	Earth work excavation under progress.	1) Sewage Collection Sump : Raft completed. Side Wall Concrete upto 5.10 Mtrs height. 2) 1.00 MLD MBBR Platform : Earth Work Excavation for 1 MLD flat form completed. Murrum bedding completed of 1.00 MLD MBBR Type STP Package Plant procured.	59.75%	Work under progress								
21	Byadagi	5	Work is taken by KUIDFC											
22	Channarayapatna	250 KLD	Yet to be started	Earth work under progress	0.05	Work in progress	Instructed the agency to expedite the progress		-	-	-	-	31-03-2022	Earth work under progress
23	Ullala	4.40 (proposed capacity)	4.40 (proposed capacity)	Work is in progress				Yes. Vide KSPCB ltr No.207dtd. 08-05-2012	0.15	0.6	0.1	0.6	31-12-2021	Work in progress
24	Karkala	3.00 (proposed capacity)	3.00 (proposed capacity)	Work is in progress				Upgradation of existing STP	0	0.8	0	0.8	31-12-2021	Work in progress
25	Tumakuru	25	Earth work completed	Pile foundation for SBR basin is in progress	5%	Work is in	Informed agency to engage more		56%	60%	54%	58%	30-06-22	

Sl. No.	ULB name	STP capacity (MLD)	STP capacity Status as on 01/03/2021	STP capacity Status as on 14/07/2021	Incremental progress (against column 4 and 5)	Reason for no change in status (reasons to be indicated)	Proposed actions to improve progress	Is the Consent letter from KSPCB obtained. If Yes, letter no. and date	Physical Progress of whole project in %		Financial Progress of whole project in %		Anticipated Date of completion of work	Remarks
									Upto Jan, 21	Upto Jun, 21	Upto Jan, 21	Upto Jun, 21		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
26	Madhugiri	4	Raft completed	a) Anoxic tank, MBBR tank 1 & 2: Reinforcement is in progress. b) Secondary clarifier: vertical side wall concreting is completed.	5%	Work is in progress	Informed agency to engage more working gangs and machineries.	Obtained. Letter no.1186/2017-18 dt:30-06-2017	25%	35%	22%	32%	31-3-2022	
27	Madhugiri	0.6	Design approved. Yet to commence.	PCC laid	2%	Work is in progress	Informed agency to engage more working gangs and machineries.	Obtained. Letter no.1521 dt:11-10-2017						
28	Madhugiri	0.08	Site has been handed over to Board during April 2021	Approval to Designs and Drawings is in progress	work will be commenced after approvals		Informed agency to engage more working gangs and machineries.							
29	Hosadurga	3.3	RCC works for Stilling chamber, fine screens, grit chamber, SBR basins, CCT, Sludge sump, centrifuge house, Admin building and DG room completed.	All civil works and electromechanical works completed	92%		11KV work and Transformer sub station work to be taken up		70%	95%	60%	85%	28-02-2022	
30	Kolar	8	Yet to commence	Site levelling work is in progress			Due to protest to commence the work by local residents of Chinnapura village work couldnot be initiated. action has been taken to resolve the issue in co ordination with Local body and District administration.		-	-	-	-		It is proposed to construct 8 MLD SBR type STP at Chinnapura tank in Kolar wherein 10.16 MLD WSP type STP is functioning. The villagers of Chinnapura are resisting to go ahead with construction. In this regard ULB intervention is sought to resolve the issue at earliest in this
31	KGF	5	70% of Civil works are completed	95% of Civil works are completed and Mechanical equipments is yet to be erected	25%	Work is in progress		Applied for consent letter	24%	75%	17.50%	57%	31-08-2021	
32	Bagepalli	4.3 & 0.55	Yet to commence	Site levelling work is in progress	Hydraulic designs of 4.30 & 0.55 MLD SBT STP was approved. Structural designs of 4.30 MLD SBT STP approval is awaited.	Work is in progress	Progress review meeting is conducted at Division office.	Consent letter for 4.30 MLD STP of WSP type was obtained from KSPCB vide ltr no. 1578 dtd: 23-01-2014 but technology now is revised to SBT. Application for consent of 0.55 MLD SBT STP was submitted online on 22-06-2021.	5	5	0	0	01-03-2022	
33	Hosakote	8.52MLD	Work stopped due to lack of funds. Revised estimate is submitted to Government for approval. Work will be taken up after approval to the Revised Estimate.					Consent letter obtained vide NO: H788 Dt:30.01.2017						
34	Sagar	9	1. Plastering and White washing works to Structural Components are in Progress. 2. Erection of Electromechanical Components works are in Progress.	1. Plastering & White washing works to Structural Components are completed. 2. Erection of Electromechanical Components works are completed. 3. Linking of Rising main work are in Progress. 4. Construction of Chain Link fencing work completed.	5%		Instructed agency to complete the balance works within the stipulated period	Yes, 4857/2018 Dt: 20-12-2018	94%	99%	68%	86%	31.03.2022	

Sl. No.	ULB name	STP capacity (MLD)	STP capacity Status as on 01/03/2021	STP capacity Status as on 14/07/2021	Incremental progress (against column 4 and 5)	Reason for no change in status (reasons to be indicated)	Proposed actions to improve progress	Is the Consent letter from KSPCB obtained. If Yes, letter no. and date	Physical Progress of whole project in %		Financial Progress of whole project in %		Anticipated Date of completion of work	Remarks	
									Upto Jan, 21	Upto Jun, 21	Upto Jan, 21	Upto Jun, 21			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
35	TMC, Sedam	9	Earthwork excavation was under progress	SBR basin Civil Structure completed upto Ground Level (50%) . Balance work under progress	10%	-	-	yes, kspcb consent order no cte-321858 dtd26.11.2020	60	70	54	56	31-12-2021		
36	CMC, Bidar	7	Designs and Drawings under approval stage	Designs and Drawings approved. Excavation Work is under progress (5%)	5%	-	Work under progress and it is proposed to be completed by March 2022	Yes. Environmental officer, KSPCB Bidar ltr No. 691 Dated:03.02.2021	0	5	0	0	31.03.2022		
37	CCB, Ballari	2 MLD Talur Road (SBR Type)	Work is under progress and it will be commissioned on 31-12-2021							35	35	30	30	31-12-2021	
38	TMC, Sandur	6.00 MLD & 0.55 MLD	0.55 / 6 MLD STP & Wetwells land is yet to be handed over by ULB.	The Hydraulic designs and GA drawings for 6 MLD STP are approved on 31.05.2021 and structural design approval is in process.		-	TMC, Sandur to be persuaded to handover STP approach road, Wetwells and 0.55MLD STP land.	Yes, KSPCB ltr. No. 34903 Dated:- 26.11.2013	2%	11%	-	4%	13.01.2023	Though land for approach road for 6.00 MLD STP is not handed over by TMC, work is proposed to be taken up after approval of structural designs physical work will be started immediately.	
39	TP, Kudligi	4.60	65% of 4.60 MLD STP, PTU, WW & Other Allied works is completed. Providing 11 KV feeder main from NH Feeder to Wet well and supply and installation of 200KVA DG set Work completed except Electrical Inspectorate approval. Supply, Erection & commissioning of Non-clog sewage pump sets and other connected accessories at RCC Wetwell - 3Nos - work was under progress.	95% 4.60 MLD STP, PTU, WW & Other Allied works trial run was done on 31.03.2021 and SCADA works and balance electro- mechanical works to be completed. *Providing 11 KV feeder main from NH Feeder to Wet well and supply and installation of 200KVA DG set Work is completed. *Supply, Erection & commissioning of Non-clog sewage pump sets and other connected accessories at RCC Wetwell - 3Nos - work is completed.	30% STP Trial run was done on 31.03.2021 and SCADA works and balance electro- mechanical works to be completed.	-	Awarded Contract agency to complete balance SCADA and other works.	Yes, KSPCB ltr. No. 1087 Dated:- 26.12.2012	85%	95%	79%	89%	15.08.2021	STP Trial run was done on 31.03.2021 and SCADA works and balance electro- mechanical works are in progress	

  
 Chief Engineer (D & M)  
 K.U.W.S & D. Board,  
 Bengaluru



16/07/21

Operating STPs								
Sl. No.	ULB name	STP capacity installed in MLD	STP Capacity Status as on 01/03/2021	STP Capacity status as on 14/07/2021	Incremental progress (against column 4 and 5)	Reason for no change in status (reasons to be indicated)	Proposed actions to improve progress	Is the Consent letter from KSPCB obtained. If Yes, letter no. and date
1	2	3	4	5	6	7	8	9
1	Hassan	10			STP is being maintained by CMC, Hassan			
2	Belur	2.4 & 0.3			STP is being maintained by TMC, Belur			
3	Srirangapatna	2.21 & 1.39			STP is being maintained by TMC, Srirangapatna			
4	Maddur	3.5			STP is being maintained by TMC, Maddur			
5	Nanjangudu	7			STP is being maintained by CMC, Nanjangudu			
6	Bannuru	2.50			STP is being maintained by TMC, Bannuru			
7	Kollegala	9	4	4				
8	Gundlupete	1.5 & 2.5			STP is being maintained by TMC, Gundlupete			
9	T Narsipura	5.5	2	2				
10	KR Nagar	1.44, 1.45 & 2.50			STP is being maintained by TMC, KR nagar			
11	Hunsuru	3.9			STP is being maintained by CMC, KR nagar			
12	Subramanya	2.6			STP is being maintained by Temple authority, Kukke Subramanya.			
13	Kanakapura	6.29	STP is being maintained by CMC, kanakapura				It is proposed to upgrade the existing WSP type STP with NEBR technology under NGT amounting to Rs 26.91 Crores. Tendering is under process.	
14	Ramanagara	7.56	STP is being maintained by CMC, Ramanagara				It is proposed to upgrade the existing 7.56MLD STP of Aerated lagoon type under NGT amounting to Rs 20.51 Crores. Tendering is under process	Consent obtained vide letter No:1110 Dt:12.02.2018
15	Shivamogga	5.13					STP is commissioned on 30-11-2020. Under CUGD scheme, construction of wetwells at Gurupura and Goshala completed. Erection of pumping machineries is under progress. After commissioning of wetwells, sewage received in this wetwells will be discharged to 5.13 MLD STP at Purle.	Yes, Letter no: PCB/115/WMC/STP/2016/ OB-461 Dt: 25-07-2016 & Addendum issued vide ltr no: 3679 Dt: 24-09-2019



Sl. No.	ULB name	STP capacity installed in MLD	STP Capacity Status as on 01/03/2021	STP Capacity status as on 14/07/2021	Incremental progress (against column 4 and 5)	Reason for no change in status (reasons to be indicated)	Proposed actions to improve progress	Is the Consent letter from KSPCB obtained. If Yes, letter no. and date
1	2	3	4	5	6	7	8	9
22	Dharwad	3	0	1.62 MLD	1.62 MLD	STP is designed for 15 years period. The sewage contribution will increase with time. The house hold connection chambers have been provided to which the individual house owners have to make connection so that their sewage flow to the network & STP.	The household owners are to be educated and encouraged to connect UGD system by conducting IEC activities.	Yes Obtained by the Senior Environmental Officer, Waste Management cell, Parisara Bhavana, Bangalore letter No.PCB/WMC/2299/STP/2 017/Reg. No.127410/OB402, dtd:26-7-2017.
23	Dharwad	20	16 to 17 MLD	16 to 17 MLD	--	--	Work is executed and completed by KUIDFC. Three Years O&M was also completed on 31.01.2021. Handing over to ULB is in process. At present the O&M of the STP plant was carrying out by KUIDFC contractor.	Yes Obtained by the Senior Environmental Officer, Waste Management cell, Parisara Bhavana, Bangalore vide letter.No.PCB/2666/STP/2 018-19/Reg. No.144467/OB/159, dtd:25-05-2018 and consent is up to 30.06.2022
24	Hubballi	3	0.13 MLD	0.94 MLD	0.81 MLD		The STP is constructed for replenishment of Unakal lake and to maintain the water level at FTL. The STP is in trial run and will be put into full operation to maintain the water level of the lake at FTL.	Yes Obtained by the Senior Environmental Officer, Waste Management cell, Parisara Bhavana, Bangalore letter No.PCB/WMC/2302/STP/2 017/Reg. No.127407/OB401, dtd:26-7-2017.
25	Hubballi	1	0.24 MLD	0.58 MLD	0.34 MLD		The STP is constructed for replenishment of Tolankeri lake and to maintain the water level at FTL. The present treatment capacity is maintaining the lake water level at FTL.	Yes Consent accorded by Senior Environmental Officer, Waste Management cell, Parisara Bhavana, Bangalore letter No.PCB/WMC/2300/STP/2 017/Reg. No.127406/OB403, dtd:26-7-2017.

Sl. No.	ULB name	STP capacity installed in MLD	STP Capacity Status as on 01/03/2021	STP Capacity status as on 14/07/2021	Incremental progress (against column 4 and 5)	Reason for no change in status (reasons to be indicated)	Proposed actions to improve progress	Is the Consent letter from KSPCB obtained. If Yes, letter no. and date
1	2	3	4	5	6	7	8	9
26	Hubballi	0.25	0.1 MLD	0.11 MLD	0.01 MLD	--	At present the quantity of sewage generated in the hydraulic zone and collected at STP is treated. The house hold connection chambers have been provided to which the individual house hold owners have to make connection to their common sewage outlet and thereby adding their sewage to the network & STP. The household owners are to be educated and encouraged to make their connections through IEC activities.	Yes Obtained by the Senior Environmental Officer, Waste Management cell, Parisara Bhavana, Bangalore letter No.PCB/MMC/2300/STP/2 017/Reg. No.127403/OB413, dtd:26-7-2017.
27	Hubballi	40	8	9	1	--	Work is executed and completed by KUIDFC including 3 years O&M. The STP is handed over to ULB.	Yes Obtained by the Senior Environmental Officer, Waste Management cell, Parisara Bhavana, Bangalore vide letter No.PCB/019/STP/Balance consent fee/2016-17/3537, dtd:27-9-2016 and by Environmental Officer, Regional Office, KSPCB, Plot no.4, Lakamanahalli Industrial Area, Dharwad - 580004 Karnataka vide letter No.KSPCB/RO/DWD/HDM C/2016-17/1470, dtd:05-11-2016 and consent is up to 30-06-2021
28	Vijayapura	31	--	--	--	--	Work executed by KUIDFC	--
29	Jamkhandi	7.6	--	--	--	--	Work executed by KUIDFC	--
30	Badami	4.3	--	--	--	--	Maintained by ULB	--
31	Mudhol	9.06	--	--	--	--	Maintained by ULB	--
32	Bhagl	3.5	--	--	--	--	Maintained by ULB	--
33	Basavana Bagewad	4.02	--	--	--	--	Maintained by ULB	--
34	Indi	4.2	--	--	--	--	Maintained by ULB	--
35	Talkote	4.24	--	--	--	--	Maintained by ULB	--
36	Bagalkot	12.5	--	--	--	--	Maintained by ULB	--
37	Karwar CMC	1.5	--	--	--	--	Maintained by ULB	--
38	Bhalkal TMC	1.5	--	--	--	--	Maintained by ULB	--

Sl. No.	ULB name	STP capacity installed in MLD	STP Capacity Status as on 01/03/2021	STP Capacity status as on 14/07/2021	Incremental progress (against column 4 and 5)	Reason for no change in status (reasons to be indicated)	Proposed actions to improve progress	Is the Consent letter from KSPCB obtained. If Yes, letter no. and date
39	Bailhongal	8.28	4	4	0	7	8	9
40	Chikodi	5.8	1.94	2.3	0.36	--	--	CFE obtained by KSPCB vide Ltr. No. 629 Dtd: 28.11.2011
41	Gokak	8.7						
42	Gadag-Betageri C	13.88	4	6.97	2.97	Work executed by KUIDFC The sewage flowing to 10.80 MLD STP, which is constructed in 1st stage UGD is diverted to 13.88 MLD STP constructed under AMRUT Scheme.	1. ULB is constantly pursued to cover 100% linking to HSC's. It is also being reviewed by the kindself of D.C, Gadag in weekly progress review Meeting. 2. Awareness programme to public has been conducted for linking to HSCs. 3. Pamphlets are distributed to the public and announcement through Loud Speakers regarding to take HSC connection to UGD network.	CFE is issued by KSPCB vide Ltr. No.4744 Dtd:22.12.2014
43	TMC, Huvina Hadagali	4.27 MLD STP (WSP Type)	3.50	3.5	-	The UGD scheme is maintained by ULB.	An Estimate for improvements to existing 4.27 MLD WSP STP amounting to Rs. 250.00 Lakhs is proposed to be taken up.	Yes, KSPCB ltr. No. 1118 Dated: 27.12.2012
44	CC, Kalaburagi	20	18	18	0			Yes, KSPCB Consent letter No.135442 dtd:21.12.2017.
45		40	40	40	0	STP is utilized fully.	Executed by KUIDFC	Yes, KSPCB Consent letter No.679 dtd:04.07.2014.
46		25	8.5	9	0.5			Yes, KSPCB Consent order no 466 dtd:20.07.2015
47	TMC,Chittapur	5.1	5.1	5.1	0		Commissioned during the Year-2017 and maintained by TMC chittapur	Yes, KSPCB Consent order No. cte-304636 dtd:19.12.2017
48	TMC,Gurmitkal	3	0.32	0.32	0	There are 500 Nos HSC's. The ULB is requested to take over the scheme for maintenance.	There is no provision of HSC's in the UIDSSMT scheme. Hence letter is addressed to the Chief officer, TMC, Gurmitkal to make an arrangement for providing HSC's.	Yes, KSPCB Consent order No. cte-304636 dtd:19.12.2017
49	CMC, Bidar	17.26	4	4.1	0.1	The STP was commissioned during DEC-2019.. Sewage is being generated from 4000 Nos of HSC's.	No. of HSC's to be increased in consultation with Local body (CMC) Bidar	

Sl. No.	ULB name	STP capacity installed in MLD	STP Capacity Status as on 01/03/2021	STP Capacity status as on 14/07/2021	Incremental progress (against column 4 and 5)	Reason for no change in status (reasons to be indicated)	Proposed actions to improve progress	Is the Consent letter from KSPCB obtained. If Yes, letter no. and date
1								
50	CCB, Ballari	30 MLD Ananthapur road (Aerated Lagoons)	Operating & commissioned on 2004			Maintained by City Corporation, Ballari		
51		15 MLD Cowl Bazaar (Aerated Lagoons)	Operating & commissioned on 2004			Maintained by City Corporation, Ballari		
52		10 MLD Enturi Nagar, Raghavendra Colony (SBR Type)		5		Bypass works from wetwell is to be done.	Commissioned on 31-12-2019	Yes, KSPCB Consent order no: CTE-318740, PCB ID: 82071 Dated: 01-07-2020
53	CMC, Hosapete	27.00 MLD STP type Activated Sludge Process (ASP)				Work is being executed by KUIDFC.		
54	CMC, Gangavathi	14	0.25	0.5	0.25	STP work is completed & commissioned on 12-12-2020.		Yes, KSPCB ltr. r no: 233 Dated: 26-05-2021
55	CMC, Raichur	20				Constructed by KUIDFC and Maintained by CMC, Raichur		
56		8				Constructed by KUIDFC and Maintained by CMC, Raichur		
57		5.5	1. Construction of All civil works completed 2. Erection of Electro mechanical equipment completed. 3. Electrification work in progress	Commissioned on 17.03.2021		Commissioned and Under Trail run.	Commissioned on 17.03.2021	Applied for consent letter.
58	Arasikere	12	4	6	2			
59	Channarayapathra	4.6				STP is being maintained by TMC, Channarayapathra		
60	Holenarasipura	3				STP is being maintained by TMC, Holenarasipura		

Sl. No.	ULB name	STP capacity installed in MLD	STP Capacity Status as on 01/03/2021	STP Capacity status as on 14/07/2021	Incremental progress (against column 4 and 5)	Reason for no change in status (reasons to be indicated)	Proposed actions to improve progress	Is the Consent letter from KSPCB obtained. If Yes, letter no. and date
1	2	3	4	5	6	7	8	9
61	Chickmagalur	20	6	7.5	1.5			
62	Birur	2.64				STP is being maintained by TMC, Birur		
63	Mandya	18.52				STP is being maintained by CMC, Mandya		
64	Malavalli	5.65				STP is being maintained by TMC, Malavalli		
65	Krishnarajpet	5				STP is being maintained by TMC, KRPet		
66	Nagamangala	3				STP is being maintained by TMC, Nagamangala		
67	Mangaluru(Baja)	20				STP is being maintained by MCC, Mangaluru		
68	Mangaluru(Surathkal)	16.5				STP is being maintained by MCC, Mangaluru		
69	Mangaluru(Pachandy)	8.75				STP is being maintained by MCC, Mangaluru		
70	Mangaluru(Kavoor)	43.5				STP is being maintained by MCC, Mangaluru		
71	Karkala	3				STP is being maintained by TMC, Karkala		
72	Sullia	2				STP is being maintained by TP, Sullia		

Sl. No.	ULB name	STP capacity installed in MLD	STP Capacity Status as on 01/03/2021	STP Capacity status as on 14/07/2021	Incremental progress (against column 4 and 5)	Reason for no change in status (reasons to be indicated)	Proposed actions to improve progress	Is the Consent letter from KSPCB obtained. If Yes, letter no. and date
1	2	3	4	5	6	7	8	9
73	Udupi	12.5				STP is being maintained by CMC, Udupi		
74	Chamarajanagar	9				STP is being maintained by CMC, Chamarajanagar		
75	Mysore	60				STP is being maintained by MCC, Mysuru		
76	Mysore	67.5				STP is being maintained by MCC, Mysuru		
77	Mysore	8				STP is being maintained by MCC, Mysuru		
78	Mysore	30				STP is being maintained by MCC, Mysuru		
79	Tumakuru	24.57				STP is being maintained by Tumakuru City Corporation		Obtained. Letter dt:30-06-1999
80	Sira	10.6	STP is commissioned on 15-02-2021	2	2			Obtained Letter no.1574 dt:07-10-2016
81	Chitradurga	20	5	5	Nil	HSC's of the entire city are not connected to the network.	DPR proposing HSC's along with sewer network for missing areas and newly developed areas is under preparation.	
82	Davanagere	14.8				STP is being maintained by Davanagere City Corporation		
83	Davanagere	20				Executed by KUIDFC		
84	Davanagere	5				Executed by KUIDFC		
85	Davanagere	20				Executed by KUIDFC		
86	Tiptur	6				Executed by KUIDFC		
87	Doddaballapur	12				Executed by KMRP		
88	Anekal	3.1	1MLD	1MLD	Nil	HSC's are not fully connected to the UGD network.	Work of providing UGD facilities to missed out areas & newly developed areas is taken up and work is under progress.	Consent obtained vide H1743 Dt:12.03.2013 for 3.1MLD and vide H972 Dt:20.10.2014 for 3.3MLD

Sl. No.	ULB name	STP capacity installed in MLD	STP Capacity Status as on 01/03/2021	STP Capacity status as on 14/07/2021	Incremental progress (against column 4 and 5)	Reason for no change in status (reasons to be indicated)	Proposed actions to improve progress	Is the Consent letter from KSPCB obtained. If Yes, letter no. and date	
1									
89	Anekal	3.3	1MLD	1MLD	Nil	7	8	9	
90	Magadi	3.7MLD	STP is Commissioned during July 2014 and and being maintained by TMC Magadi						Applied by TMC, Magadi
91	Kolar	10.16	STP is being maintained by City Municipal Council Kolar						
92	Mulbagal	6.3	2	2.5	0.5	STP is yet to be taken over by ULB at present STP is maintained by agency	ULB has provide more number UGD HSCs		
93	Srinivasapura	3	STP is being maintained by Town Municipal Council Srinivasapura						
94	Malur	4	1.5	1.6	0.1	STP is yet to be taken over by ULB	ULB has to take up works to rectify damaged outfall and internal sewerlines and to provide more number UGD HSCs		
95	Chikkabalpura	10	STP is being maintained by City Municipal Council Chikkaballapur						
96	Chintamani	2	STP is being maintained by City Municipal Council Chintamani						
97	Shidalghatta	3.1	STP is being maintained by City Municipal Council Shidalghatta						
98	Basavana Bagewadi	0.25	Commissioned during March, 21	0.1	0.1	House owners to take connections		Yes Online PCB ID No. 82267 Date:20.06.2020	

  
**Chief Engineer (D & M)**  
**K.U.W.S & D. Board,**  
**Bengaluru**



Non-operational STPs

Sl. No.	ULB name	STP capacity installed in MLD	STP capacity status as on 01/03/2021	STP capacity status as on 14/07/2021	Incremental progress (against column 4 and 5)	Reason for no change in status (reasons to be indicated)	Proposed actions to improve progress	Is the Consent letter from KSPCB obtained. If Yes, letter no. and date
1	Dharwad	0.25	0	0	0	UGD network, house connections & STP have been commissioned. Individual house hold owners have to connect their sewage outlet to the HSC chamber. Hence, sewage flow to the UGD network & STP is NIL and the STP is non-operational. The proposal has been submitted to Hubballi-Dharwad Municipal Corporation (HDMC) to take over STP, for further maintenance.	HDMC has to educate the house hold owners to connect their sewage outlet to the HSC chamber, by conducting IEC activities and other options.	Yet to be obtained
2	Hungund	3.5	-	-	-	HSCs to be provided	ULB is requested to provide HSCs for operation of STP	
3	Gadag-Betageri	10.8	0	0	-	1) Pumping machinery installed in Wetwell are under repair. 2) The scheme is not taken over by the ULB	1) An estimate for repairs of Pumping machinery installed in Wetwell amounting to Rs. 16.00 Lakhs submitted to the Commissioner, CMC Gadag-Betageri vide this office letter No. 492 Dt: 15.01.2021 for Counter signature and deposition of funds & Reminder letter also submitted vide this office letter No. 277 Dated: 02.06.2021. The same is awaited. 2) ULB is constantly pursued to cover 100% linking to HSCs. It is also being reviewed by the kindself of D.C, Gadag in weekly progress review Meeting. 3) The Chief Engineer (D&M), KUWS & DB Bengaluru approved an estimate vide proceedings No. 41 Dt:07.04.2021 for Rs. 18,000.00 IEC activities regarding awareness programme to utilise UGD system by linking to HSC to the public. 4) Pamphlets are distributed to the public and announcement through Loud Speakers regarding to take HSC connection to UGD network. 5) To keep old STP running an estimate of Rs. 16.00 Lakhs is submitted to ULB for Counter signature and deposition. 6) For O & M of the STP and old network an estimate of Rs. 125.00 Lakhs is submitted to	CFE is obtained from Senior Environmental Officer, Bangalore vide letter No.4134 dated 28.10.2019

Sl. No.	ULB name	STP capacity installed in MLD	STP capacity status as on 01/03/2021	STP capacity status as on 14/07/2021	Incremental progress (against column 4 and 5)	Reason for no change in status (reasons to be indicated)	Proposed actions to improve progress	Is the Consent letter from KSPCB obtained. If Yes, letter no. and date
1	2	3	4	5	6	7	8	9
4	Laxmehwar TMC	5.5	0	0	-	1) The scheme is handed over to ULB for maintenance 2) HSCs to be provided 3) To complete the UGD scheme with balance linking works additional amount of Rs. 160 lakhs is required. The same is requested to ULB.	The estimate for Providing House Service Connections to the UGD Scheme for amounting to Rs. 979.00 Lakhs has been submitted to Government vide Board letter No. 2331 Dated: 22.12.2018 for according Administrative Approval. However, the ULB is requested to give HSCs directly by the public.	--
5	Naragund TMC	4.18	0	0	-	1) UGD scheme to Naragund town was taken up with an estimated cost of Rs. 720.00 Lakhs. This was approved during 23.02.2004 2) The estimate does not include HSCs. Now estimate amounting to Rs. 981.00 Lakhs is submitted to Govt. for approval vide Board letter No. 283 Dated: 09.05.2019. Approval is	The estimate for Providing House Service Connections to the UGD Scheme for amounting to Rs. 981.00 Lakhs has been submitted to Government vide Board letter No. 283 Dated: 09.05.2019 for according Administrative Approval. However, the ULB is requested to give HSCs directly by the public.	--
6	Sadalaga	3.72	STP commissioned on 29.03.2018 and in non-operational condition.	Non Operational	-	Due to differential pressure in Compartment 1 & 2 on accounts of heavy rains and flood, the 2nd compartment bed has breached and completely emptied on 20.04.2021.	Quarry for hearing material is identified and soil test reports are obtained. Process of rectification work is held up due to heavy rain in Dooganga river. Work will be taken up and completed by 15.11.21.	Obtained. KSPCB Ltr. No. 2046 Dtd : 15.12.2011
7	Jewargi	3.25	-	-	0	The UGD Scheme is handed over to ULB during the Year-2012. Outfall Sewerline is damaged and HSCs are not connected.	The estimate for Construction of STP of SBR technology amounting to Rs. 16.43 crore under NGT is Approved vide G.O. dt:25.03.2021. Tendering is under process.	
8	Shikaripura	5.00	-	-	-	After commissioning of the scheme, patana panchayat Turuvekere has not accepted for further maintenance of the scheme due to the reason that HSCs were not executed in the scheme	STP trial run carried out on 01-03-2019. The internal and outfall sewerline is executed by KHB authorities and the work is under progress. Once the sewer network is completed, sewage will be pumped to STP.	
9	Turuvekere	1.95	-	-	-	After commissioning of the scheme, patana panchayat Turuvekere has not accepted for further maintenance of the scheme due to the reason that HSCs were not executed in the scheme	DPR for providing 2nd Stage UGD scheme to Turuvekere town amounting Rs. 1184.00 lakhs is submitted to Gok vide letter no.271/2021-22 dt:24-05-2021 from Board for approval. The scheme includes 1. Providing HSCs 4900 nos 2. Providing Internal sewerlines with construction of manholes in left out areas 3. Providing Internal sewerlines with construction of manholes in newly developed areas. Approval is awaited	Obtained. Ltr dt:21-03-2013

Sl. No.	ULB name	STP capacity installed in MLD	STP capacity status as on 01/03/2021	STP capacity status as on 14/07/2021	Incremental progress (against column 4 and 5)	Reason for no change in status (reasons to be indicated)	Proposed actions to improve progress	Is the Consent letter from KSPCB obtained. If Yes, letter no. and date
1	2	3	4	5	6	7	8	9
10	Harapanahalli	7.92	-	-	-	HSCs are to be taken up by ULB	-	-
11	Hunnabad	6	-	-	0	HSC's are not connected.	Taken up by KUIDFC under KMRP	KUIDFC
12	Bidar	17.26	Work Executed by KUIDFC					KUIDFC
13	Guledgudda	3.74	Work executed and Maintained by ULB					
14	Ilkal	8	Work Executed by KUIDFC					
15	Haveri	4.71	Work is executed by KUIDFC					
16	Ranebenur	7.5	Work is executed by KUIDFC					

  
 Chief Engineer (D & M)  
 K.U.W.S & D. Board,  
 Bengaluru



**Proposed STPs**

Sl. No.	ULB name	STP capacity Proposed in MLD	STP capacity Status as on 01/03/2021	STP capacity Status as on 14/07/2021	Incremental progress (against column 4 and 5)	Reason for no change in status (reasons to be indicated)	Proposed actions to improve progress	Is the Consent letter from KSPCB obtained. If Yes, letter no. and date
1	Hassan	3	4	5	6	7	8	9
2		20						Yes, Letter No 1360 dated : 12/03/2021
3		10						
4		5						
5		2						
6	Belur	5						Yes, Letter No 1361 dated : 12/03/2021
7	Sriragapatta	5						Yes vide letter No. 1999/2020-21 dtd:24.03.2021
8	Pandavapura	3						No
9	Bannuru	3.80 - 1No 0.65-2 nos 0.23-1No 0.15-1no						Yes vide ltr no 314 dt: 15-3-2021
10	Nanjangudu	8 - 1 No 0.2-1 no 0.3-1no						Yes vide ltr no 314 dt: 15-3-2021
11	Hunsuru	8						Yes vide ltr no 314 dt: 15-3-2021
12	Bantwala	4.14 & 0.22 (proposed capacity)	4.14 & 0.22 (proposed capacity)					Yes vide KSPCB ltr No.156 dtd. 02-05-2012

Sl. No.	ULB name	STP capacity Proposed in MLID	STP capacity Status as on 01/03/2021	STP capacity Status as on 14/07/2021	Incremental progress (against column 4 and 5)	Reason for no change in status (reasons to be indicated)	Proposed actions to improve progress	Is the Consent letter from KSPCB obtained. If Yes, letter no. and date
13	Subramanya	2.6	2.6					Upgradation of existing STP
14	Bellhangady	0.006 (proposed capacity)	0.006 (proposed capacity)				DPR for providing FSSM system to the town amounting to Rs.10.30 crore is Administratively approved by the Govt. vide GO No.UDD 01/UWL 2019 (B-3) dated 25-03-2021 and technically sanctioned by the Chief Engineer, KUWS & D Board, Mysuru vide Proceedings No. 36 dated 06-04-2021. Due to single bidder participation, 1st call tender was cancelled vide this office proceedings No. 365; dated: 02.06.2021. Second call invited vide Chief Engineer, KUWS & DB, Mysuru tender notification No 380/2021-22 dated:03-06-2021, since no bidders have qualified, Call -2 tenders have been cancelled vide proceedings No. 553; dated: 02.07.2021. Fresh tenders are invited on 03-07-2021.	Will be applied.
15	Kanakapura	6.29					DPR for Upgradation of existing UGD scheme in Kanakapura city amounting to Rs.26.91 lakhs is approved by Gok vide order No.UDD 01/UWL/2019 dtd:25.03.2021. There is a provision for upgradation of existing STP.	Consent obtained vide letter N.
16	Honnali	3.3					Upgradation of the existing STP	Consent for implementation from KSPCB was obtained ltr no:1286 dtd:18/03/2021 For further getting consent
17	Kusthagi	4.51					DPR of Rs.6553.00 Lakhs is submitted to Government for Administrative approval vide ltr No.1138 Dh:17.10.2020.Approval is awaited.	Yet to be obtained
18	Kerur	3.5					DPR of Rs. 6835.00 lakhs is submitted to Government for Administrative approval vide ltr No.2931 Dh:18.02.2019.Approval is awaited.	Yet to be obtained
19	Gulegudda	5.32					DPR of Rs.4592.00 lakhs is submitted to Government for administrative approval vide letter No. 2992 Dated. 29.02.2020.Approval is awaited.	Yet to be obtained
20	Mulgeund TP	3					DPR of Rs. 5500.00 Lakhs is submitted to Government for according Administrative approval vide letter No. 3146 Dtd. 08.03.2019. Approval is awaited.	Yet to be obtained
21	Karwar CMC	3					DPR's approved vide G.O. No. UDD/01/UWL/2019/Bengaluru Dtd: 25.03.2021. The short term tender for the said work is invited by the Chief Engineer, K.U.W.S & D Board, Dhanwad vide notification No. 29 Dtd : 06.04.2021 (1st Call) and Notification No. 318 Dated: 03.06.2021 (2nd Call) & Tendering process is under progress.	Yet to be obtained

Sl. No.	ULB name	STP capacity Proposed in MLD	STP capacity Status as on 01/03/2021	STP capacity Status as on 14/07/2021	Incremental progress (against column 4 and 5)	Reason for no change in status (reasons to be indicated)	Proposed actions to improve progress	Is the Consent letter from KSPCB obtained. If Yes, letter no. and date
1	2	3	4	5	6	7	8	9
22	Khanapura (TP)	0.50	0.50					Yet to be obtained
23	M.K Hubli (TP)	0.25	0.50					Yet to be obtained. Addressed a letter to KSPCB by AEE, Bailhongal Ltr. No. 35 Dtd : 22.06.2021 for according CFE
24	Saundatti (TP)	3.5						
25	Munolli (TP)	1.00	0.25					
26	Ugarkurd (TMC)	2.1						Consent received for CFE by the KSPCB vide Ltr. 111 Dtd : 27.04.2021
27	Kudachi (TMC)	2.03						Letter is addressed to KSPCB vide AEE, Chikodi Ltr. No. 61 Dtd : 23.04.2021 for according CFE
28	Examba (TP)	1.45						Consent received for CFE by the KSPCB vide Ltr. 112 Dtd : 27.04.2021
29	Ainapur (TP)	1.66						Consent received for CFE by the KSPCB vide Ltr. 114 Dtd : 27.04.2021
30	Chinchili (TP)	1.67						Consent received for CFE by the KSPCB vide Ltr. 113 Dtd : 27.04.2021
31	TMC, Jewargi	5.83	Estimate submitted to GOK for approval	Estimate amounting to Rs 16.43 Crores was A/A vide GO No 2591 dtd 26.03.2021.	Tender invited on 30.06.2021 last date for submission of			

1	2	3	4	5	6	7	8	9	
Sl. No.	ULB name	STP capacity Proposed in MILD	STP capacity Status as on 01/03/2021	STP capacity Status as on 14/07/2021	Incremental progress (against column 4 and 5)	Reason for no change in status (reasons to be indicated)	Proposed actions to improve progress	Is the Consent letter from KSPCB obtained. If Yes, letter no. and date	
32	Ahralgud	1.1	The lands for construction of STPs is to be handed over by the local body. After handing over the lands to the board work will be started.						No
33		1.3							
34	Ullala	1.70 (proposed capacity)	1.70 (proposed capacity)	There is stay from the Hon'ble High Court for acquisition of land.					Yes, Vide KSPCB Itr No.207/dtd. 08-05-2012
35	Kaup	0.30 (proposed capacity)	0.30 (proposed capacity)	For construction of STP land is yet to be handed over by the ULB					Yes, KSPCB Itr No.0B-424 dtd. 31-07-2017
36	Kundapur	2.80, 0.135 & 0.07 (proposed capacity)	2.80, 0.135 & 0.07 (proposed capacity)	For construction of STP land is yet to be handed over by the ULB					Yes, KSPCB Itr No.60134 dtd. 04-04-2014
37	Kunrigal	5.8	Revised Estimate Submitted to GoK for approval		No progress	Revised estimate submitted to GoK Vide Itr no.2712 dtd:25-01-2019 for approval	Revised estimate submitted to GoK Vide Itr no.2712 dtd:25-01-2019 for approval	To be obtained	
38	Gubbi	2.9	Revised Estimate Submitted to GoK for approval		No progress	Revised estimate submitted to GoK Vide Itr no.2350 dtd:18-12-2018 for approval	Revised estimate submitted to GoK Vide Itr no.2350 dtd:18-12-2018 for approval	To be obtained	
39	Mulbagal	1	Revised Estimate Submitted to CE(D&M) office for approval	Revised Estimate Submitted to CE(D&M) office for approval	No progress	Estimate is under Scrutiny at CE(D&M) Office			
40	Chintamani	6.4	The DPR project amounting to Rs. 14.40 Cr returned from the Government due to shortage of funds on 09-01-2019						
41	Bidadi	6MILD, 2 nos of 0.1MILD, 0.16MILD	Tender awarded. Agency yet to conclude the agreement.						Obtained consent for land vide letter No:288 Dk:02.11.2020

Sl. No.	ULB name	STP capacity Proposed in MLD	STP capacity Status as on 01/03/2021	STP capacity Status as on 14/07/2021	Incremental progress (against column 4 and 5)	Reason for no change in status (reasons to be indicated)	Proposed actions to improve progress	Is the Consent letter from KSPCB obtained. If Yes, letter no. and date
1	2	3	4	5	6	7	8	9
42	Hosakote	1.82MLD	Land is not yet handed over by ULB					
43	Segar	0.62	DPR is under preparation.					
44	CMC, Shahapura	13 MLD	DPR prepared for Rs.17260.00 Lakhs and Submitted to the Govt vide letter No.526 date : 24--07--2019 for Administrative Approval.					
45	CMC, Shorapura	4 No's 7.50, 1.00, 0.75 and 0.15	DPR prepared for Rs.5041.00 Lakhs and Submitted to the Govt vide letter No.1114 date : 13--11--2019 for Administrative Approval.					
46	TMC, Aland	8.18	DPR prepared for Rs.11845.00 Lakhs and Submitted to the Govt vide Managing Director, KUWSDB, Kalburgi letter No.720 date : 12-10-2020 for Administrative Approval.					
47	CCB, Ballari	2.00 (3 Nos) (SBR Technology)	Estimate amounting to Rs.2550.00 lakhs was cleared in 107th TA & TSC Meeting held on 11-06-2021 and the same will be placed before the ensuring Board meeting.					
48		4.50 (1 No) (SBR Technology)						
49	CMC, Raichur	13.22 (SBR Technology)	Estimate amounting to Rs.1460.20 lakhs was cleared in 107th TA & TSC Meeting held on 11-06-2021 and the same will be placed before the ensuring Board meeting.					
50	TMC, Deodurga	5.00 (SBR Technology)	Estimate amounting to Rs.3694.00 lakhs is submitted to the Govt. for administrative approval vide the Managing Director, KUWS & DB, Bengaluru Itr No: 787 and 1173 Dated: 17-10-2020 and 18-01-2021					
51	TMC, Lingasur	6.82	Estimate amounting to Rs.9150.00 lakhs is submitted to the Govt. for administrative approval vide the Managing Director, KUWS & DB, Bengaluru Itr No: 897 Dated: 04-10-2019.					

Sl. No.	ULB name	STP capacity Proposed in MILD	STP capacity Status as on 01/03/2021	STP capacity Status as on 14/07/2021	Incremental progress (against column 4 and 5)	Reason for no change in status (reasons to be indicated)	Proposed actions to improve progress	Is the Consent letter from KSPCB obtained. If Yes, letter no. and date
52	TMC, Siruguppa	8.03	Estimate amounting to Rs.91,50,00 lakhs is submitted to the Govt. for administrative approval vide the Managing Director, K.U.W.S & DB, Bengaluru dt No:3030 Dated: 12-01-2017					

  
**Chief Engineer (D & M)**  
**K.U.W.S & D. Board,**  
**Bengaluru**

## Compliance to Rejuvenation of Water Bodies

NGT Order Dated: 20.02.2020 & 14.12.2020		Implementation status				
1	2	3	4	5	6	
1	Current Status (Compliance as on till date)	Desirable Level of Compliance in terms of statutes	Gap Between current status and desired levels	Proposal of attending the gap with time lines	Name and designated officer for ensuring compliance to provisions under statute (Commissioner/Director) with Mobile No.	
	The Rejuvenation of Water Bodies will be undertaken as per the guidelines of Jal Shakti Abhiyan & AMRUT schemes	100%	65%	Dec-2022	7760545536 Rudramuni (Joint Director)	
	Compliance to Rejuvenation of Water Bodies					

*Sulekha*

**Executive Engineer**

**Directorate of Municipal Administration**

B-12, 100ft

## Compliance on prevention of Illegal Sand Mining

Sl. No.	SWM Rule Clause	NGT order Dated:	Implementation Status								
1	2	3	4								
<b>Compliance on prevention of Illegal Sand Mining</b>											
1	<p>Compliance to order dated: 24.7.2019 of Director of Mines and Geology Bengaluru in OA 606/2018.</p>	<p>Action taken to curb Illegal Sand Mining and Transportation in the State during <b>April 2021 to June 2021</b>.</p> <p><b>28</b> Illegal Sand Mining cases were booked. In <b>12</b> Cases, accused admitted the</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Production (in MT)</th> <th style="text-align: center;">Royalty (Rs. in lakhs)</th> <th style="text-align: center;">APP/ AAPP</th> <th style="text-align: center;">DMF</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">7,03,372</td> <td style="text-align: center;">562.70</td> <td style="text-align: center;">2016.95</td> <td style="text-align: center;">56.44</td> </tr> </tbody> </table>	Production (in MT)	Royalty (Rs. in lakhs)	APP/ AAPP	DMF	7,03,372	562.70	2016.95	56.44
Production (in MT)	Royalty (Rs. in lakhs)	APP/ AAPP	DMF								
7,03,372	562.70	2016.95	56.44								
	<p><b>Current Status of Action taken about Illegal Mining Activities</b> (April 2021 to June 2021)</p>	<p><b>Current Status of Production and Royalty / Additional Periodic Payment collected from Lessees in Karnataka State</b> (April 2021 to June 2021)</p>	<p><b>Name and designation of designated officers for ensuring compliance under statutes</b> (Commissioner/ Municipal Commissioner/ Chief Officer) with Mobile No.</p>								
	<p>Proposal of attending the gap with time lines</p>	<p>The Karnataka New Sand Policy 2020 has been issued as per Government order CI 344 MMN 2019, Bangalore dated: 05.05.2020 and published in the Gazette dated: 21.05.2020. It has come into force on the</p>	<p>Sri. Dr. Lakshammamma Deputy Director (Mineral Administration) Dept. of Mines and Geology, Bengaluru. +919480031622</p>								

		<p>guilty and penalty of <b>Rs. 4.35 lakhs</b> has been recovered. In <b>16</b> cases, Private complaints / FIR were registered.</p> <p><b>252</b> Illegal Sand Transportation cases were booked. In <b>99</b> Cases, accused admitted the guilty and penalty of <b>Rs. 60.60 lakhs</b> has been recovered. In <b>153</b> cases, Private complaints / FIR were registered.</p> <p><b>11</b> Illegal Sand Storage cases were booked. In <b>09</b> Cases, accused admitted the guilty and penalty of <b>Rs. 16.27 lakhs</b> has been recovered. In <b>02</b> cases, Private complaints / FIR were registered.</p>	
<p>same day and it is under implementing stage.</p>	<p>Government has sanctioned special enforcement squad called</p>	<p><b>“Mineral Protection Force” to curb illegal sand mining and transportation</b> in the 8 districts. Coy of order enclosed.</p>	

  
**Deputy Director (M.A.)**  
**Department of Mines & Geology**



ಕರ್ನಾಟಕ ಸರ್ಕಾರ

ಸಂಖ್ಯೆ:ಅಜನಿ/ತಾಂತ್ರಿಕ/NGT-606/2021-22/642

ನಿರ್ದೇಶಕರ ಕಛೇರಿ,  
ಅಂತರ್ಜಲ ನಿರ್ದೇಶನಾಲಯ,  
2ನೇ ಮಹಡಿ, ಕೆ.ಎಸ್.ಎಫ್.ಸಿ ಭವನ,  
#1/1, ತಿಮ್ಮಯ್ಯ ರಸ್ತೆ, ಬೆಂಗಳೂರು-52,  
ದಿನಾಂಕ: 13.07.2021.  
ಇ-ಮೇಲ್: [gwdkar@gmail.com](mailto:gwdkar@gmail.com)  
ಫೋನ್ ನಂ: 080-22268732.

ಇವರಿಗೆ,

ನಿರ್ದೇಶಕರು,  
ಪೌರಾಡಳಿತ ನಿರ್ದೇಶನಾಲಯ,  
9ನೇ ಮಹಡಿ, ವಿಶ್ವೇಶ್ವರಯ್ಯ ಗೋಪುರ,  
ಬೆಂಗಳೂರು-01.

ಮಾನ್ಯರೆ,

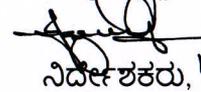
ವಿಷಯ : ಮಾನ್ಯ ರಾಷ್ಟ್ರೀಯ ಹಸಿರು ನ್ಯಾಯ ಮಂಡಳಿಯ ಪ್ರಕರಣ ಸಂಖ್ಯೆ: O.A  
No. 606/2018ಕ್ಕೆ ಸಂಬಂಧಿಸಿದಂತೆ ನೀಡಿರುವ ಆದೇಶಗಳ ರೀತ್ಯ  
ತ್ಯಮಾಸಿಕ ವರದಿಯನ್ನು ಸಲ್ಲಿಸುವ ಬಗ್ಗೆ.

ಉಲ್ಲೇಖ: SWM Section ಇವರ ಪತ್ರ ಸಂಖ್ಯೆ: ನಅಇ 232 ಸಿಎಸ್‌ಎಸ್ 2019  
ದಿನಾಂಕ: 09.07.2021.

\*\*\*\*\*

ಮೇಲ್ಕಂಡ ವಿಷಯಕ್ಕೆ ಸಂಬಂಧಿಸಿದಂತೆ, ಉಲ್ಲೇಖಿತ ಪತ್ರದಲ್ಲಿ ಕೋರಿರುವಂತೆ ಮಾನ್ಯ ರಾಷ್ಟ್ರೀಯ  
ಹಸಿರು ನ್ಯಾಯ ಮಂಡಳಿಯ ಪ್ರಕರಣ ಸಂಖ್ಯೆ: O.A No. 606/2018ಕ್ಕೆ ಸಂಬಂಧಿಸಿದಂತೆ ಅಂತರ್ಜಲ  
ನಿರ್ದೇಶನಾಲಯದ ಅನುಸರಣ ವರದಿಯನ್ನು ನಿಗದಿತ ನಮೂನೆಯಲ್ಲಿ ಭರ್ತಿ ಮಾಡಿ ತಮ್ಮ ಅವಗಾಹನೆಗೆ  
ಸಲ್ಲಿಸಿದೆ.

ತಮ್ಮ ವಿಜ್ಞಾಪಿಸಿ,

  
ನಿರ್ದೇಶಕರು, 13/7/21

ಅಂತರ್ಜಲ ನಿರ್ದೇಶನಾಲಯ,  
ಬೆಂಗಳೂರು  


## COMPLIANCE TO GROUND WATER EXTRACTION:-

### Current Status (Compliance as on 30<sup>st</sup> June-2021 ):-

- The Groundwater Directorate is carrying out the work of assessing the Groundwater Resources as per the Groundwater Estimation Methodology (GEM) given by the Groundwater Estimation Committee (GEC) since 1999.
- Based on the Groundwater Recharge and Groundwater Utilization, the areas are categorized into over exploited, critical, semi-critical and safe.

Sl No	Category	Groundwater Utilization/ withdrawal against groundwater recharge in %
1	Over Exploited	>100
2	Critical	90-100
3	Semi Critical	70-90
4	Safe	<70

- If we observe over a period of time the Over exploited taluks have gradually increased thus creating stress on groundwater availability. The below table shows the gradual increase in over exploited taluks from the results of previous groundwater assessment.

Year of Assessment	Over Exploited taluks	Critical taluks	Semi Critical taluks	Safe taluks	Mixed taluks	Stage of Groundwater Development in %
2004	22	NIL	NIL	51	102	70
2009	35	3	10	70	58	68
2011	30	6	7	70	63	64
2013	43	14	21	98	-	66
2017	45	8	26	97	-	70
2020	52	10	35	130	-	65

- As per Groundwater Resources estimation 2020 the overall stage of groundwater utilization is 65% against availability.
- In order to control over exploitation of groundwater, the State Government has enacted the Karnataka Groundwater (Regulation and control of Development and Management) Act 2011, Rules 2012. As per the section 10 of the Act 2011 the areas will be notified.

- There is a restriction to drill a new bore well in the notified taluks. As per section 11 of the Act 2011, prior permission from the appropriate authority should be taken to drill a new bore well in the notified area.
- Registration of drilling rigs is made compulsory to drill bore well in any part of the State. The registration certificate is issued in form-7A by the Karnataka Groundwater Authority.
- Any commercial user of groundwater for industry / infrastructure / mining / entertainment purposes, must obtain permission / NOC from Karnataka Groundwater Authority (KGWA).

**COMPLIANCE TO GROUND WATER CONTAMINATION: -**

Not applicable to Groundwater Directorate.

**COMPLIANCE TO GROUND WATER RECHARGE: -**

**Current Status (Compliance as on 30<sup>st</sup> June-2021): -**

- Various line departments in the supply side are involved in the construction of check dams, infiltration wells, under other various groundwater recharge Schemes. Groundwater directorate is giving technical assistance to these line departments for identifying suitable location for construction of Artificial Recharge Structures.
- The NOC for groundwater withdrawal by Karnataka Groundwater Authority are issued based on the recharge capacity of the industry /infrastructure / mining / entertainment projects.
- Ground water “Awareness Programmes” are conducted for Public and Students in Schools/Colleges” and also through media to create awareness among public about the judicious usage of groundwater.

Compliance to Solid Waste Management Rules 2016

## Implementation status

4

Sl. No	NGT Order Dated:30.06.2021
1	3

## Compliance to duties of waste generators

Sl. No	Current Status (Compliance as on 30 <sup>th</sup> June 2021)	Desirable Level of Compliance in terms of statutes	Gap Between current status and desired levels	Proposal of attending the gap with time lines	Name and designation of officer ensuring compliance to provisions under statute (Commissioner/Director) with Mobile No.
1	As per Groundwater Resources estimation 2020 the overall stage groundwater utilization is 65% against availability.	<68% of Groundwater utilization against availability	Nil	2025 Achieved	Sri. G. Jayanna Director I/c, Groundwater Directorate, Bangalore. Mb No. 9449542169
	Compliance to Ground Water Extraction/ Recharge				
	Compliance to Ground Water Contamination				

  
Director,  
Groundwater Directorate,  
Bengaluru

## Compliance to 351 Polluted River Stretches in the Country (Karnataka)

SI No.	Thematic area	Current Status	Desirable level as per status	Gap between current Status and desired levels	Time frame for addressing the Gap	Name, designation, contact number, of designated officer for ensuring compliance to the provisions under statute
1	351 Polluted River stretches	<p>Number of ULBs under 17 PRS of Karnataka = 41</p> <p>* Sewage generated = 884.25 MLD</p> <p>* Existing STP capacity = 668.73 MLD</p> <p>* Sewage treated = 414.3 MLD</p> <p>* Percentage sewate treatment = 46.85%</p> <p>* Percentage capacity utilization = 62%</p> <p><b>Operational STPs:</b> 44 STPs of 668.73 MLD capacity are operational in 24 ULBs and treat 414.3 MLD sewage out of the generated 884.5 MLD sewage;</p> <p><b>Under construction STPs:</b> 7 STPs of 171.3 MLD capacity is under construction in 5 ULBs</p> <p><b>Proposed STPs:</b> 34 STPs of 102.7 MLD capacity are proposed in 25 ULBs</p> <p><b>Progress in 2nd quarter 2021-22:</b> (1) Projects for STP and/or UGD works 23 ULB were Administratively approved by Government of Karnataka. (2) 7.5 MLD capacity STP in Ranebennur (ULB in 17 PR) was commissioned.</p>	100%	53%	<p>timeline as per NGT is 31/03/2021. Stakeholder departments have to indicate the target date</p>	Urban Development Department, Gok

## 122 Non –attainment cities

Sl. No.	Thematic area	Current Status	Desirable level	Gap between current status and desired levels	Time lines for attending gaps	Name and designation of the Designated Officer for ensuring compliance	
1	122 Non –attainment cities	There are 4 non attainment cities in the Karnataka state	20-30% reduction in PM concentration from 2017 level	2019-20 (Average) Bangalore City 81.6 µg/m <sup>3</sup>	2019-20 to 2024-25 (5 years)	Stakeholder, Department identified in the action plan	
		a) Action plan for Bengaluru city -44 (Approved during 29th September 2019 by CPCB)					
		b) Action plan for Davangere-27 Action points (approved during 25th June 2019 by CPCB)	20-30% reduction in PM concentration from 2017 level	2019-20 (Average) Davanagere 85.8 µg/m <sup>3</sup>	2019-20 to 2024-25 (5 years)	Stakeholder, Department identified in the action plan	
		c) Action plan for Hubli-Dharwad city -27 Action points (approved during 25th June 2019 by CPCB)	20-30% reduction in PM concentration from 2017 level	2019-20 (Average) Hubli-Dharwad 78.25 µg/m <sup>3</sup>	2019-20 to 2024-25 (5 years)	Stakeholder, Department identified in the action plan	

100 Industrial cluster

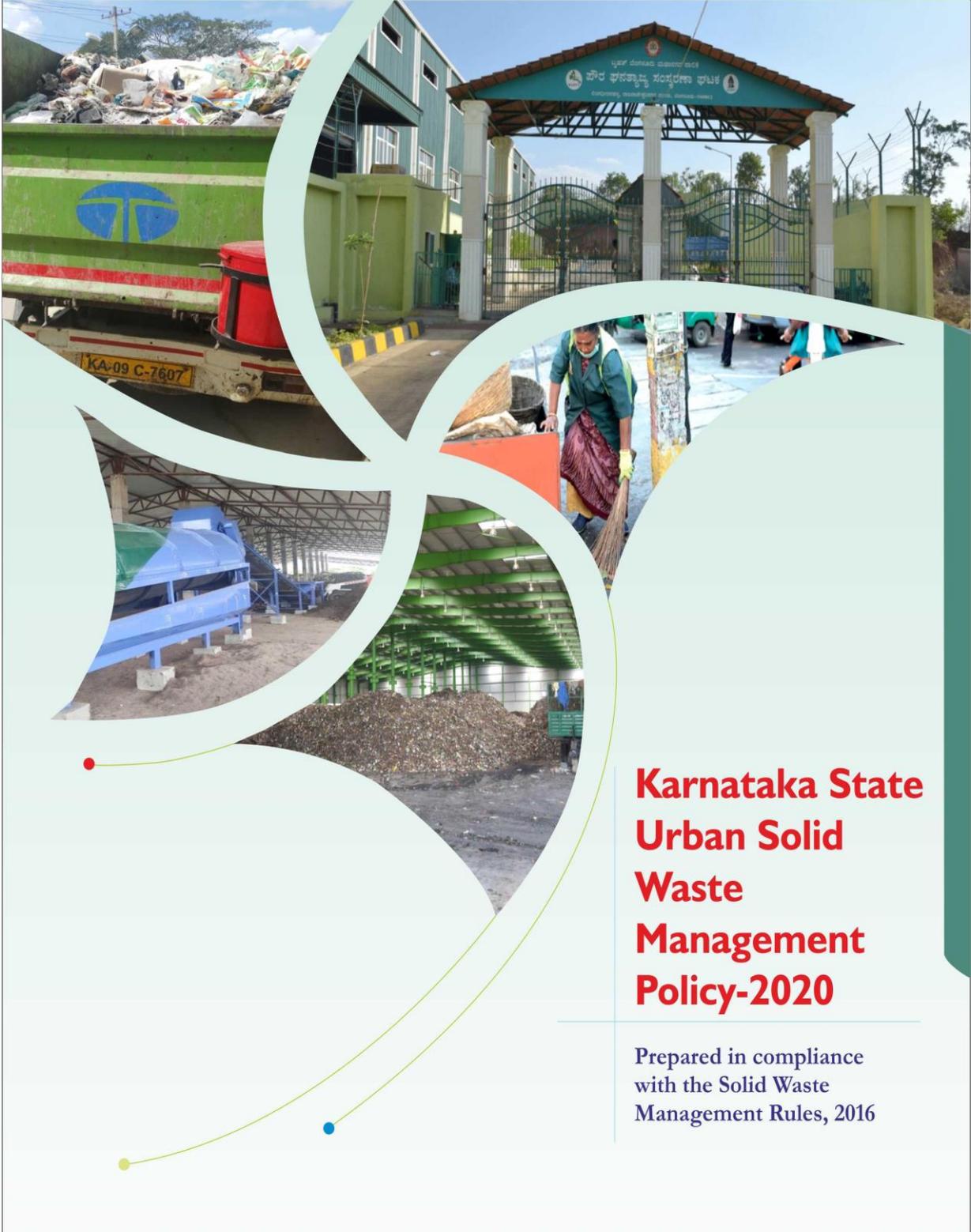
Sl. No.	Thematic area	Current Status	Desirable level	Gap between current status and desired levels	Time lines for attending gaps	Name and designation of the Designated Officer for ensuring compliance
1	100 Industrial cluster	Kolhar Industrial Area Bidar ( achieved 23.08% of action plan)  Peenya Industrial area (achieved 7.14% of action plan) Jigani Bommasandra industrial (achieved 14.28 % of action plan)	Bring down the CEPI* score below 60	66  78.14 70.95	As per Action plan approved by CPCB	Stakeholder Depratments identified in the Action Plan.

\* CEPI - Cmprehensive Environmental Pollution Index

**Latest Solid Waste Management Implementation Status in 90 GPs selected as per NGT directions for developing as model GPs**

SL No.	DISTRICT	TALUK	GP	DPRs Approved Yes/No	Total No of Households + Shops + other waste Generators	Total No of households practicing HH Composting ( Pipe / Kitchen etc)	No of HHs covered under Door to Door collection in Segregation manner	Total waste generated in Ton	Wet waste Collected and Treated in Ton	Dry waste Collected in Ton	Compost sale Amount in Rs	Recyclable sale Amount in Rs (Dry Waste)	User fee Amount in Rs	Fines Amount in Rs	Remarks
1	Bagalkote	Bilagi	Yedahalli	Yes	2301	0	212	2.8	1.61	1.2	0	0	0	0	
2		Mudhol	Mantoor	Yes	2816	0	2152	2.9	0	0.25	0	0	0	0	
3		Jamkhandi	Hirepadasalagi	Yes	2399	50	2306	2.3	0	0	0	0	0	0	
4	Ballari	Bellari	Nelludi	YES	1492	0	0	0.16	0	0	0	0	0	0	
5		Hadagali	Holalu		2000	0	0	0.2	0	0	0	0	0	0	
6		Hosapete	Kallahalli	YES	948	0	0	0.12	0	0	0	0	0	0	
7	Belagavi	Khanapur	Nandgadh	Yes	2114	1864	1864	3.06	0	0.2					
8			Devalatti	Yes	1162	0	1080		0	0.02					
9		Gokak	Doopdala	Yes	2487	0	2156		0	0.08					
10	Bengaluru (Rural)	Dodballapur	Bashettihalli	Yes	5145	0	4036		1.5	0.2	2000	1000	10		Converted to ULB
11		Dodballapur	Majarahosahalli	Yes	2419	0	1560		1	0.6	3000	800	20		
12				Yes	2380	0									
13	Bengaluru (Urban)	North	Rajanakunte	Yes	3243	3243	3243		2	0.5	2000	3000	30	0	
14		North	Bettanahaturu	No											
15		Anekal	Shanthipura	Yes	3236	1736	1500		1.5	0.2	0	15000	0	0	
16	Bidar	Aurad	Sundal	Yes	1662	0									
17		Basavakalyan	Sastapur	Yes	1547	0									
18		Bidar	Chambol	Yes	1139	0									
19	Chamarajanagar	Chamarajanagar	Santhamarahalli	No	2090	1986	1986	0	0	0	0	0	0	0	
20		Gundlupet	Hangala	Yes	1988	1862	1862	0	0	0	0	0	0	0	
21		Kollegal	Lokkanahalli	Yes	1567	1534	1534		0	0.75	0	0	0	0	
22	Chikkaballapura	Chintamani	Hirekattigenahalli	Yes	1484	800	1372	1.48	0.74	0.74			27440		
23		Sidlaghatta	Nagamangala	No	450										
24		Gowribidanur	Hosur	Yes	1995	1500	1667		1.67	0.05		1000	33340	1500	
25	Chikkamagaluru	Tarikere	Amrutapura	yes	891	56	826	0.52/ per week	0	0.52/ per week	0	0	10200	0	
26		Mudigere	Kalasa	Yes	2892	0	1992	0.5/day	0.2	0.3	0	0	55000	0	
27		Narasimharajapura	B. Kanabur	Yes	3505	0	2500	0.6/day	0.3	0.3	0	0	0	0	
28	Chithradurga	Hosadurga	Belaguru	Yes	2391	0	2176			0.5					
29		Chithradurga	Medehalli	Yes	6829	0	6651								
30		Molakalmuru	Rampura	Yes	3337	3000	3000								
31	Davanagere	Davanagere	Belavanur	No	0	0	0		0	0	0	0	0	0	
32		Channagiri	Santhebennur	No	0	0	0		0	0	0	0	0	0	
33		Honnali	Chiluru	Yes	1508	250	400	0.5	0	0.5	0	0	0	0	
34	Dharwad	Dharwad	Hebballi	Yes	3206	893	3200	0.71	0	0.43	0	5000	20	0	
35		Hubballi	Anchatageri	Yes	1452	654	1452	1	0	0.61	0	8000	30	0	
36		Kundahola	Koobinala	Yes	1043	989	1043	0.89	0	0.53	0	10000	30	0	
37	Dakshina Kannada	Beltangadi	Ujire	Yes	6530	3500	1825	3.25	0.5	2	3300	2000	75000	1000	
38		Puttur	Alankaru	Yes	1050	789	261	0.21	0.05	0.1	0	0	15000	0	
39		Sulya	Aranthodu	Yes	1515	0	780	0.2	0	0.1	0	2000	22000	0	
40	Gadag	Rona	Abbigeri	Yes	2350	500	1175		0	0.1	0	0	0	0	
41		Gadag	Lakkundi	Yes	2656	400	885		0	0.1	0	0	0	0	
42		Shirahatti	Magadi	Yes	1684	150	506		0	0.2	0	0	0	0	
43	Hassan	Belur	Hagare	Yes	2048	1850	1919	0.05	0.01	0.04	0	300	0	0	
44		Sakleshpura	Baage	Yes	1200	1100	0	0.03	0	0.03	0	150	0	0	
45		Sakleshpura	Hanbalu	Yes	1442	1261	1261	0.03	0	0.03	0	180	0	0	
46	Haveri	Ranebennur	Kavalettu	Yes	2077	1928	1928	0.85	0.51	0.34	0	0	0	0	
47		Ranebennur	Tumminakatti	Yes	2483	2325	2325	1.5	0.9	0.6	3000	2166	5812	0	
48		Savanur	Teveramellihalli	No	3220	1066	680	2.49	1.49	1	0	1666	0	0	
49	Kalaburagi	Kalaburagi	Tajsultanpur	Yes	2600	0	0	1.3	0	0.52	0	0	0	0	
50		Afzalpur	DevaGhangapur	Yes	1787	0	0	1.45	0	0.58	0	0	0	0	
51		Kamalapura	Dongeragaon	Yes	1478	0	0	1.15	0	0.46	0	0	0	0	
52	Kodagu	Madikeri	Benguru	Yes	527	110	110		0.03	0.23	0	3000	0	0	
53		Somvapat	Nanjarayapatna	Yes	708	7044	400		0	0.2	0	5000	0	0	
54		Virajpet	Kutta	Yes	1085	1002	750		0.05	0.3	0	6000	0	0	
55	Kolar	Kolar	Kurugal	Yes	0	0	0		0	0					
56		Bangarapet	Kethaganahalli	Yes	0	0	0		0	0					
57		Mulbagal	Uthanur	Yes	1760	1620	1620		0.05	0.21	700	1680			
58	Koppal	Gangavathi	Shriramanagar	Yes	2502	50	955	2.2	2	0.2					
59		Koppala	Alavandi	Yes	2308	0	0		0	0					
60		Koppala	Munerabhada	Yes	2152	0	753	2.5	1	1.5					
61	Mandya	Mandya	Bevinahalli	Yes	1474	1031	1474	0.16	0	0.16	0	0	0	0	
62		Maddur	Goruvanahalli	Yes	1390	834	1390	0.22	0	0.22	0	0	0	0	
63		Krishnarajpet	Bukinakere	Yes	2150	1612	2150	0.17	0	0.17	0	0	0	0	
64	Mysuru	Hunsuru	Kattemalavadi	Yes	2588	1	1438		0	0.77	0	0	0	0	





# Karnataka State Urban Solid Waste Management Policy-2020

Prepared in compliance  
with the Solid Waste  
Management Rules, 2016

Issued by  
**Directorate of Municipal Administration**  
Government of Karnataka

In coordination with  
**Department of Urban Development**  
Government of Karnataka

## A. INTRODUCTION

1. The Government of Karnataka has always strived to ensure that progress and development of the state is environmentally sound, socially just and economically equitable as is enshrined in Article 39 of the Constitution of India. All of its laws, policies, programs and schemes have been guided by values enshrined in Articles 48A and 51A(g) of the Constitution, to enhance environmental quality and thus the welfare of the people of the state. The State Government has also strived to ensure that development is respectful of environmental limits. This is done by adopting various progressive principles of environmental jurisprudence such as Principle of Intergenerational Equity, Principle of Sustainable Development, Polluter Pays Principle, Public Trust Doctrine, Principle of Free, Prior and Informed Consent, Doctrine of Absolute Liability, Principle of Ecocentrism among others.
2. Karnataka was amongst the first states to adopt the concept of participatory and planned development of rural and urban areas by legislating the Karnataka Town and Country Planning Act, 1961. The state was amongst the earliest to ensure participatory governance became a reality where Karnataka Municipal Corporation Act, 1976 was comprehensively amended to conform to Constitutional 74<sup>th</sup> Amendment (Nagarpalika) Act, 1992. In addition, planning of rural and urban futures is to be overseen by District/Metropolitan Planning Committees as envisaged in Articles 243ZD/ZE.
3. With regard to solid waste management, State Government has endeavoured to implement applicable environmental and labour laws and regulations relating to solid waste management. However, the intensification of urbanization and consumerism, combined with a widespread state of unpreparedness across cities and towns of Karnataka, has turned the situation into a complex and dynamic problem. In recent decades, the state has witnessed unprecedented urbanization and infrastructure development which has created great opportunities for millions. But it has also resulted in various unintended consequences, exacerbated disparities in economic development, and caused a variety of environmental and public health stresses.
4. The challenges of solid waste management are mounting as consumerism among urban population is rapidly increasing. The composition of waste has also transformed substantially in recent decades - from a time when much of the waste was organic, and thus compostable, waste now is increasingly non-biodegradable. In addition, the common practice of dumping mixed solid waste in quarries, lakes, streams, low lying areas, forests, open spaces, etc., creates a series of problems that have very dangerous consequences. Surface and ground water aquifers in such areas are heavily contaminated due to discharge of toxic leachates from such dumpsites. Quite often the waste dumped is burnt or catches fire, causing serious air pollution. Such sites also are perfect breeding sites for mosquitos and contribute to the spread of dengue, chikungunya, malaria, and other such deadly communicable diseases. Solid waste strewn is not merely major public health problem, but also contributes to spoiling aesthetics of pristine open areas such forests, farmlands, mountainous, wetland and coastal landscapes.
5. With regard to the personnel working with waste management, the Karnataka Government has always strived to ensure there is no exploitation and ill-treatment of labour as required per Article 43 of the Constitution. It has always been the State Government's endeavor to ensure operational systems are fair and economical, and the entire process overall secures environment and public health of all. The State of

Karnataka has been vigilant in protecting the dignity, rights and entitlements of Pourakarmikas and those involved in handling waste. This is indicative in the fact that in 1973, Karnataka issued an order banning the carrying of night soil, thus becoming the first state in India to take action in an effort to stop a most inhuman, but widespread, practice. The Government also took the decision then to change the degrading nomenclature of sweepers and scavengers to that of “Pourakarmikas” (Health Workers).

6. The state of Karnataka recognizes that the prevailing systems of waste management are majorly dependent on Pourakarmikas. They toil to keep cities clean and healthy for all and the service rendered by the Pourakarmikas over the decades has protected the health of citizens. Under this policy, the Government of Karnataka aims to ensure that economic and social upliftment of workers employed in solid waste management is a prime concern for all Urban Local Bodies (“ULBs”) and state agencies.
7. In addition to the Pourakarmikas, a key task of waste management is undertaken by thousands of informal waste workers who recover resources from solid waste to earn a living. They provide major environmental and public health services and there is an urgent need to accord them due recognition so they can be integrated into solid waste management systems for their and wider public benefit.
8. Taking into account all that is stated above, the Karnataka State Urban Solid Waste Management Policy (“Karnataka Urban SWM Policy”) was formulated after widespread consultation with various departments and agencies of the State Government, civil society organizations, workers unions and other stakeholders involved in solid waste management, in conformance with the Solid Waste Management Rules 2016. Thereafter, the draft was circulated with all local bodies and the wider public by placing it on the website of Directorate of Municipal Administration on March 20, 2020 and inviting comments. The comments received have been duly reviewed and has helped shaped this Karnataka Urban SWM Policy.

## B. CURRENT SITUATION IN KARNATAKA

The State of Karnataka consists of 285 ULBs which is further divided into the following categories of ULB on the basis of population and other criteria

### Categorisation of ULBs in Karnataka

Category of ULB	Population	Number of ULBs	Waste Generated in TPD
Town Panchayat	10,000 to 20,000	99	496.7
Town Municipal Councils	20,000 to 50,000	116	1315.79
City Municipal Councils	50,000 to 3,00,000	59	2214.44
City Corporations	3,00,000 and above	11	6936.35
Total Municipal Waste generation in TPD			10,963

As on date, there are 11 city corporations (including Bengaluru which is a mega city having a population of more than 1,00,00,000 persons), 59 city municipal councils, 116 town municipal councils, 99 town panchayats and 4 notified areas in the state of Karnataka. Most ULBs spend maximum portion of their overall budget for waste management on collection and transportation of municipal solid waste. Often less than 10% of the budget is spent on treatment, processing and final disposal of solid waste. Proper

processing including recycling facilities do not exist in most ULBs in Karnataka and therefore, majority of the waste is being taken to unscientific disposal sites for dumping. The State of Karnataka recognizes that there needs to be significant focus and effort on segregation of waste and thereafter, proper processing in its ULBs to ensure maximum recovery of resources from such segregated waste.

### C. APPLICABILITY

The Karnataka Urban SWM Policy applies to all the urban local bodies within the State of Karnataka. It is clarified that the hazardous waste, bio-medical waste, e-waste, faecal sludge and sewage, construction and demolition waste and industrial waste (solid and liquid components) are not covered by this policy because they do not fall within the scope of Solid Waste Management Rules 2016 (“**SWM Rules 2016**”) and are governed by different regulations. The State of Karnataka shall prepare separate policies, strategies and regulations for such waste streams as required under applicable law and requirements of the state.

### D. VISION

The vision for the Karnataka Urban SWM Policy is to achieve sustainable solid waste management through waste minimisation and maximum recovery of resources along with worker equity and inclusion and protection of public health.

### E. OBJECTIVES

1. Cover 100% of waste generators through door to door collection by March 2021.
2. Achieve 100% source segregation of municipal solid waste in all ULBs within Karnataka.
3. 100% of the biodegradable waste to be processed using appropriate technology by December 2021.
4. No waste to be dumped or burnt in open space.
5. Effectively implement notification No. FEE 17 EPC 2012, Bangalore dated March 11, 2016 by Forest, Ecology and Environment Department, Government of Karnataka where certain categories and products made of plastic are banned (“**Karnataka Plastic Ban**”) across all ULBs.
6. Bio-stabilising followed by bio-mining of legacy waste or any other appropriate method of dumpsite management for all dumpsites within the state by 2023.
7. The Extended Producer Responsibility (“**EPR**”) of brand owners and producers shall be enforced by the ULBs to collect and process plastic waste with the state.
8. By 2025, reduce waste going to the landfills to less than 30% of the total waste generated.

### F. GUIDING PRINCIPLES

1. Introduction of “Namma Kasa, Namma Javabdhari” (our waste, our responsibility) initiative in all ULBs within the state.
2. To promote the practice of Reduce, Reuse, Recycle, (3Rs) to achieve reduction in waste generation and disposal.
3. Shift from a “linear approach” of waste disposal to adopting principles of “circular economy” for solid waste management where the focus is on recovery of resources rather than disposal of waste.
4. Encouraging and promoting best practices for solid waste management at a decentralised level to create resilient systems and communities.
5. Ensure environmental, social and safety linked safeguards for those personnel (formal and informal) such as pourakarmikas and informal waste workers involved in waste collection and handling.

6. Adoption of Polluter Pays Principle across the ecosystem for solid waste management.
7. Establishment of self-sustainable and financially viable solid waste management systems where operating expenditures are met through various applicable funds/schemes in place at ULBs, revenues from operations and SWM service charges which are charged on an equitable basis. In addition, ULBs shall ensure optimal routing, systematic transportation, efficient usage of manpower and appropriate mechanising solid waste management activities for minimising the operation and maintenance costs.
8. Encourage promotion of entrepreneurship in various aspects linked to solid waste management and inclusion of the informal sector into the formal waste value chain in ULBs.
9. Encourage citizen participation in solid waste management systems including changing and sustaining behavioural change towards waste practices, create awareness about the responsibility of citizens, institutions and community to manage the waste generated by them.
10. Create awareness about the linkage of waste management with public health and environment conservation.
11. Capacity building and strengthening of ULBs, as well as public and private institutions, communities and other stakeholders to prioritise the actions on planning, implementation of waste management hierarchy and operation, maintenance and monitoring of waste management systems.
12. Collaboration with different government departments and agencies for implementation, operation, funding, monitoring and capacity building of solid waste management systems in ULBs. This includes convergence of appropriate schemes applicable to sanitation and waste management in urban areas.
13. In the event, a small fraction of e-waste and construction and demolition waste from households and other waste generators enter the primary collection system as a part of dry waste, they shall not be mixed with solid waste and ULBs shall ensure that they are handled, processed or disposed in accordance with the relevant regulations.
14. The ULBs in existence prior to 2017 shall ensure 100% compliance of SWM Rules, 2016 while there shall be a grace period of two years from the date of publication of the Karnataka Urban SWM Policy for recently upgraded ULBs (i.e. created after 2017) for full compliance of the SWM Rules, 2016.
15. To the extent possible, fund management for solid waste management activities shall be decentralised and the ULBs shall progressively reduce their dependence on the state and central governments for funds.

## **G. PROPOSED SPECIFIC POLICY INITIATIVES FOR DIFFERENT WASTE STREAMS, GENERATORS AND OTHER ASPECTS**

### *1. Households generators and small commercial units*

- (i) Segregation of solid waste into three categories will be mandatory and the following colour codes will be followed by the ULBs for the bins: **(a)** green for bio-degradable waste; **(b)** blue for non-biodegradable waste / this could also be a white HDPE woven bag (i.e. in compliance with 2 bin-1 bag system), and **(c)** red for domestic hazardous waste including domestic sanitary waste. In no event shall the waste generators be permitted to use plastic liners in the bins.
- (ii) Establish service level standards for hygienic and systematic collection of waste from households, offices, shops, commercial establishments and other waste generators in the ULBs.
- (iii) Establish robust systems targeted at cleanliness and smooth waste collection in low-income neighbourhoods and slums.

- (iv) Devise suitable incentive-disincentive mechanisms including imposition of penalties to achieve segregated collection of waste through dedicated stream wise collection.
- (v) Devise focused behaviour change strategies for compliance to source-segregation of waste by citizens and reduction in waste generation.
- (vi) Encourage home composting or biomethnation with incentives (as feasible), expert guidance awareness activities and supporting mechanisms such as compost collection.
- (vii) Ensure separate collection of domestic hazardous waste (including sanitary wastes) and link their disposal to existing biomedical waste treatment systems wherever available and other appropriate processing/disposal facilities.

## 2. *Public areas and markets*

- (i) Establish cleanliness standards (including for street sweeping) for public areas such as roadside, lakeside, parks, public buildings and public transport (buses/metro etc.) to be maintained at all times by ULBs
- (ii) Devise bye-laws with penalties for curbing burning of waste, littering and throwing of un-segregated waste in public/open areas and creation of blackspots.
- (iii) Encourage on-site composting of horticultural waste and leaf litter within parks and other feasible open areas.
- (iv) Encourage street-level lane composters/in situ-processing for wet waste and leaf composting in residential layouts, governmental offices, educational institutions and other possible areas.
- (v) Encourage onsite biomethnation of wet waste and onsite use of biogas and/or on-site composting to the extent possible in public markets including those operated by Agricultural Produce Market Committee (APMC).
- (vi) Encourage linkages to piggeries, fishery units, chicken farms or dairy units for wet waste generated at public markets that cannot be processed locally.
- (vii) Ensure separate collection of dry waste from every stall and/or vendor located at public markets.

## 3. *Bulk Waste Generator Policy*

- (i) Segregation of solid waste into three categories will be mandatory and the following colour code will be followed by the bulk waste generators i.e. waste generators generating 100 kgs of waste per day and/or having a plot area exceeding 5,000 square meters, for the bins: **(a)** green for bio-degradable waste; **(b)** blue for non-biodegradable waste / this could also be a white HDPE woven bag (i.e. in compliance with 2 bin-1 bag system), and **(c)** red for domestic hazardous waste including domestic sanitary waste. In no event shall the waste generators be permitted to use plastic liners in the bins.
- (ii) Ensure mandatory processing or pre-processing of all wet waste in situ by all newly constructed bulk waste generators and existing bulk waste generators (to the extent they have space available).
- (iii) Design focused provisions and systems for bulk waste generators based on “polluter pays principle” and SWM Rules 2016, through engagement of authorised third party waste management agencies, especially in City Corporations and City Municipal Councils. In Town Panchayats and Town Municipal Councils, ULBs can collect and process segregated waste from

bulk waste generators for a period of two years from the effective date of the Karnataka Urban SWM Policy or effective date of model SWM Bye-laws, whichever is earlier, until a robust independent third party system is set up.

- (iv) ULBs to provide the necessary frameworks which will enable assistance and guidance in segregation, storage, and decentralised processing of solid waste to bulk waste generators.
- (v) Encourage reduction, reuse and recycling of waste generated by bulk waste generators through various legal, market and fiscal instruments.

#### 4. *Biodegradable (Wet) Waste:*

- (i) Promote home composting by all households on land which is above 30 by 40 square feet in size.
- (ii) ULBs to create and facilitate decentralised facilities of different capacities that are suitable for various localities and areas for processing of wet waste using composting and biomethanation technologies. The details of these decentralised facilities along with vendors for home/community composting kits, SWM related equipment and other useful information relating to waste management could be published on the ULB website for public information.
- (iii) All decentralised and centralised waste processing facilities shall carry out composting of only segregated wet waste to keep the compost free from contaminants and in compliance with the standards set out in the SWM Rules 2016 and relevant FCO standards.
- (iv) Facilitate linkages with farmers, nurseries, gardens and other markets for compost generated at the wet waste processing facilities.

#### 5. *Dry Waste (including plastic waste)*

- (i) Ensure collection of segregated dry waste from waste generators and focus on recycling and processing of dry waste. ULBs to establish a recycling and reuse policy for all categories of dry waste, to the extent they are recyclable.
- (ii) Establish dry waste aggregation and sorting centres and materials recovery facilities in ULBs and support setting up of different recycling and waste processing units that ensure maximum recovery of resources.
- (iii) Ensure maximum local decentralised aggregation, sorting and handling of dry waste collected through dry waste collection centres at ward levels.
- (iv) Provide incentives and disincentives to enforce compliance with Karnataka Plastic Ban and discourage unnecessary use of single use items which are not covered under the Karnataka Plastic Ban.
- (v) Integrate waste pickers, informal waste aggregators, scrap dealers and other members of the informal sector into the formal dry waste management systems
- (vi) Establish linkages to cement plants and existing waste to energy and incineration plants for processing of non-recyclable dry waste.
- (vii) Explore use of plastic waste in roads in accordance with prescribed standards.
- (viii) Mobilise and utilise funds available under extended producer responsibility (EPR) obligations for management of plastic waste.
- (ix) Waste to Energy technologies will be the least preferred option for processing dry waste and recovery of energy from waste is preferable only after implementation of waste reduction and

responsible recycling programs. The appropriateness of waste to energy plants for a community must be evaluated on a case-by-case basis and should only be considered (a) on a stand-alone basis, for ULBs which are able to supply at least 500 MT per day and on a regional basis, for a cluster of ULBs which are able to supply at least 500 MT per day, to the plant; (b) if they are economically viable and do not have an adverse environmental impact after necessary assessments have been carried out; and (c) after approval from KSPCB for new and/or experimental technologies in Indian context.

#### 6. *Special Streams of Wastes Policy:*

- (i) Manage slaughter house waste from meat shops and other areas in compliance with applicable regulations such as guidelines issued by the Karnataka State Pollution Control Board (KSPCB), Water (Prevention and Control of Pollution) Act, 1974, Prevention of Cruelty to Animals (Slaughter house) Rules 2001 and similar guidelines on this subject.
- (ii) Ensure that ULBs fix a calendar for periodic (e.g. monthly) collection of domestic hazardous waste (except sanitary waste which shall be collected daily) and bulky waste.
- (iii) ULBs shall earmark a portion at DWCCs/MRFs for depositing domestic hazardous waste with adequate safeguards.
- (iv) Design guidelines and systems to ensure management of waste resulting from unforeseen circumstances such as natural disasters, health epidemics and pandemics and other similar situations.
- (v) Technologies relating to micro incineration of sanitary waste will be assessed with caution by the ULBs and it should be ensured that sanitary waste incinerators meet the standards prescribed by the Central Pollution Control Board (CPCB), KSPCB and other relevant authorities.

#### 7. *Sanitary landfill and legacy waste*

- (i) There shall be no disposal of biodegradable waste or mixed waste into sanitary landfills. Only non-usable, non-recyclable, non-biodegradable, non-combustible, non-reactive inert waste, street sweepings, drain silt, inerts and processed rejects and residues from waste processing facilities should go to sanitary landfill.
- (ii) The ULB shall ensure that the residue from different processing facilities shall not exceed 35% of the solid waste delivered to the processing facility and shall be further reduced to less than 30% within 5 (five) years from the effective date of the Karnataka Urban SWM Policy.
- (iii) As a first step, till 100% source segregation is achieved from all areas, ULBs should carry out windrow stabilisation of all wet or mixed waste before landfill disposal. Disposal of all unstabilised waste below or above ground in airless heaps should be avoided. After December 2021, there shall be no disposal of mixed waste in processing or disposal facilities.
- (iv) Undertake bio-stabilising followed by bio-mining of legacy waste, bio-remediation or any other appropriate method of dumpsite management as per guidelines issued by the CPCB and KSPCB to avoid long-term pollution of underground water sources and release of methane and other greenhouse gases.
- (v) There shall be no burning of waste in the landfill or surrounding areas by pourakarmikas, members of the informal sector, service providers/contractors or any other person.

8. *SWM Personnel and informal sector*

- (i) Ensure health, welfare and dignity of all solid waste management workers, especially Pourakarmikas
- (ii) Seek to promote and protect safe and decent livelihoods of waste pickers, waste collectors and aggregators.
- (iii) The ULBs will ensure regular payment of minimum wages and statutory benefits to pourakarmikas in accordance with applicable labour regulations. Benefits such as housing, healthcare, insurance etc. for pourakarmikas employed at the ULB shall be as per the eligible welfare schemes operated by the government.
- (iv) The ULBs shall also ensure occupational safety of its own staff including pourakarmikas and staff of any authorised third party involved in solid waste management activities by providing appropriate and adequate personal protective equipments. In addition, the ULBs should organise for regular medical check-ups of the pourakarmikas and other eligible employees for occupational diseases and treatment of injuries resulting from solid waste management activities under applicable welfare schemes.
- (v) Acknowledge and recognise the primary role played by the informal sector in reducing waste through material recovery. Make provisions to integrate the informal waste sector into the solid waste management system of the ULBs.

9. *Administrative reform:*

- (i) Ensure coordination between all stakeholders at State and ULB level for smooth execution of SWM projects (land availability, suitable clearances etc) and continuous service level maintenance. Encourage formation of ward committees in ULBs especially in City Corporations and City Municipal Corporations to enable community participation in solid waste management activities.
- (ii) Ensure suitable provisions be made in master plans of ULBs for waste processing and disposal facilities.
- (iii) Ensure collection and maintenance of reliable data on waste generation, processing and disposal by leveraging technology, surveys and coordination between various stakeholders in the waste value chain.
- (iv) To ensure robust waste management systems are in place, the State of Karnataka and the ULBs will strive to make waste management systems technically and financially sustainable and well monitored.
- (v) The ULBs will also ensure that they have bye-laws in place for effective implementation and enforcement of provisions of SWM Rules 2016 and this Karnataka Urban SWM Policy
- (vi) The involvement of community based organisations, non-governmental organisations and private sector in waste management will be carried out responsibly such that applicable regulations relating to waste, labour, environment etc. are fully complied with.
- (vii) Establish mechanisms for stringent monitoring of air and water pollution levels in waste processing facilities, dumpsites and sanitary landfills and surrounding neighbourhoods. The processing plants shall not be stressed with waste which is more than 120-130% of designed capacity.

- (viii) Encourage partnerships of ULBs with KSPCB to devise surveillance mechanisms for achieving prescribed pollution control standards for solid waste management.
- (ix) The SWM aggregation and processing plants should be provided with adequate security and surveillance to ensure safety and proper functioning of the facilities.

10. *Local Body capacity enhancement:*

- (i) Ensure a dedicated wing with various capabilities including administrative, technical and project implementation expertise in the field of solid waste management at the state and ULB levels.
- (ii) Ensure officers in key positions for solid waste management are guaranteed a substantial tenure to deliver on SWM activities and projects.
- (iii) Build adequate infrastructure capacity within the ULBs for enabling efficient delivery of SWM services.
- (iv) The state and/or district administration to design SWM tender documentation and standard contract templates for ULBs (excluding BBMP) to use at the time of outsourcing solid waste management activities and provide legal and other advisories in adapting them to local conditions. The ULB personnel should also be capacitated to monitor and enforce the obligations under the tender and contractual documentation.
- (v) Ensure sufficient funding to ULBs for efficient and viable SWM through enhanced grants, taxation powers, collection of SWM service charges and other forms of resource mobilization. The state shall provide ULBs flexibility in utilization of such funds for different components of SWM based on local needs and priorities. To the extent possible, funds for solid waste management shall not be diverted for other purposes by the ULBs and that they should be treated as tied funds.
- (vi) The State will devise normative standards for manpower, transportation, SWM aggregation and processing facilities, street sweeping and other critical components of waste management systems for adoption by the ULBs.

To conclude, the State of Karnataka will adopt waste management systems that implement a waste management hierarchy with the aim to reduce the amount of waste being disposed, while maximising recovery of resources and resource conservation. The adoption of these principles will help in minimising the amount of waste to be disposed, thus also minimising the public health and environmental risks associated with it. It is essential that the state returns to a situation when waste as a concept does not exist and all stakeholders participate in affirming the precious and irreplaceable value of resources, the need to use them with utmost care, and to ensure future generations are not denied what is due to them.



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# URBAN SOLID WASTE MANAGEMENT STRATEGY 2020

Prepared in compliance with the Solid Waste Management Rules, 2016



Issued by  
**Directorate of Municipal Administration**  
Government of Karnataka

In coordination with  
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## A. INTRODUCTION

1. Waste management is one of the most pressing issues for governmental authorities in India due to rising urbanisation, increase in waste generation and types of waste, lack of space for waste processing facilities, limited financial resources and inadequate waste management systems and infrastructure. In this context, the Solid Waste Management Rules, 2016 (“**SWM Rules 2016**”) were framed by the Ministry of Environment, Forest and Climate Change to address the issue of solid waste management and identify the roles and responsibilities of different stakeholders including government bodies and the waste generators in the solid waste management ecosystem. Under the SWM Rules 2016, the urban local bodies (“**ULB**”) are responsible for implementation of these rules within their jurisdictions. In addition, Solid Waste Management is an essential service and a mandatory function of the municipal authorities across the State and they are required to keep the cities and towns clean in an environmentally sustainable manner.
2. Karnataka, like the rest of the country and perhaps many regions of the world is grappling with the challenge of municipal solid waste. Growing population, rapid urbanization and deviation from well-established age old sustainable consumption/livelihood practices in the guise of modernization has resulted in drastic increase in the per capita waste which continues to increase. The rapid increase in waste generation is demanding for a renewed attention to the increasing problem of municipal solid waste management. Therefore, it is imperative to derive a policy and strategy to structure the solid waste management systems in the State of Karnataka in a sustainable manner where there is emphasis on maximum recovery of resources from waste along with worker equity and inclusion and protection of public health. In this context, the State of Karnataka will adopt an integrated waste management system that implements a waste management hierarchy with the aim to reduce the amount of waste being disposed of, while maximising recovery of resources and resource conservation. It is closely linked to the 4R approach (reduce, reuse, recycle and recover) and principles of circular economy which also emphasises the importance of waste reduction, reuse, recovery and recycling over other forms of waste processing or management.
3. As mandated in the Constitutional 73<sup>rd</sup> Amendment (Panchayat Raj) Act 1992 and Constitutional 74<sup>th</sup> Amendment (Nagarpalika) Act 1992, and in conformance with SWM Rules 2016 and other applicable rules, notifications, orders per the Environment Protection Act 1986, and in conformance with relevant judgments of the Hon’ble Supreme Court, Hon’ble High Court of Karnataka and Hon’ble National Green Tribunal, the Government of Karnataka resolves to take all such steps as are necessary to ensure the State is fully compliant with all applicable rules, norms, standards, and processes necessary to manage solid waste in a socially just, humane, economically viable and environmentally wise manner.
4. Under Rule 11(a) of the SWM Rules 2016, every state is required to prepare a state policy and solid waste management strategy for the state in consultation with stakeholders including representative of waste pickers, self-help group and similar groups working in the field of waste management consistent with the SWM Rules 2016, national policy on solid waste management and national urban sanitation policy of the Ministry of Urban Development. The State of Karnataka has already formulated a state policy containing the vision, aims and approach of the state for solid waste management in urban areas (“**Karnataka Urban SWM Policy**”). As a next step, it now proposes to adopt the state strategy as an implementation document with an aim to aid the state and ULBs to set up solid management systems in urban areas.
5. The state strategy for solid waste management (“**Karnataka State Urban SWM Strategy**”) in the following paragraphs contains an overview of the waste flow from generation to disposal including the different options available to the ULB for processing solid waste while recovering the maximum resources from it. It also provides a framework for the implementation and monitoring of waste management systems and the strategy to be adopted by the ULB to effectively manage the different streams of waste generated within their jurisdictions. In addition the State Government, by way of this strategy, determines roles and responsibilities of Urban Local Bodies, statutory and regulatory agencies in implementing solid waste management strategies

detailed here, and as per timelines for compliance recorded. This would be undertaken in comprehensive compliance with provisions of Environment Protection Act and its subordinate rules and notifications, in particular SWM Rules 2016, and also all other applicable laws and rules, to produce a socially just, environmentally wise and economically viable management approach to solid waste management across Karnataka. The State Government resolves to provide all necessary financial, managerial and infrastructure support to ensure these strategies are effectively implemented.

6. In this context, this Karnataka State Urban SWM Strategy is applicable for all urban areas in the state of Karnataka. It is meant for key players, relevant authorities and other functionaries of “local bodies” in the state of Karnataka to prepare the SWM related plans and procedures for management of solid waste (including plastic waste) within their jurisdictions. It is clarified that the hazardous waste, bio-medical waste, e-waste, faecal sludge and sewage, construction and demolition waste and industrial waste (solid and liquid components) are not covered by this strategy because they do not fall within the scope of SWM Rules, 2016 and are governed by different regulations. The State of Karnataka shall prepare separate policies, strategies and regulations for such waste streams as required under applicable law and requirements of the state.

#### B. KEY PRINCIPLES FOR SOLID WASTE MANAGEMENT:

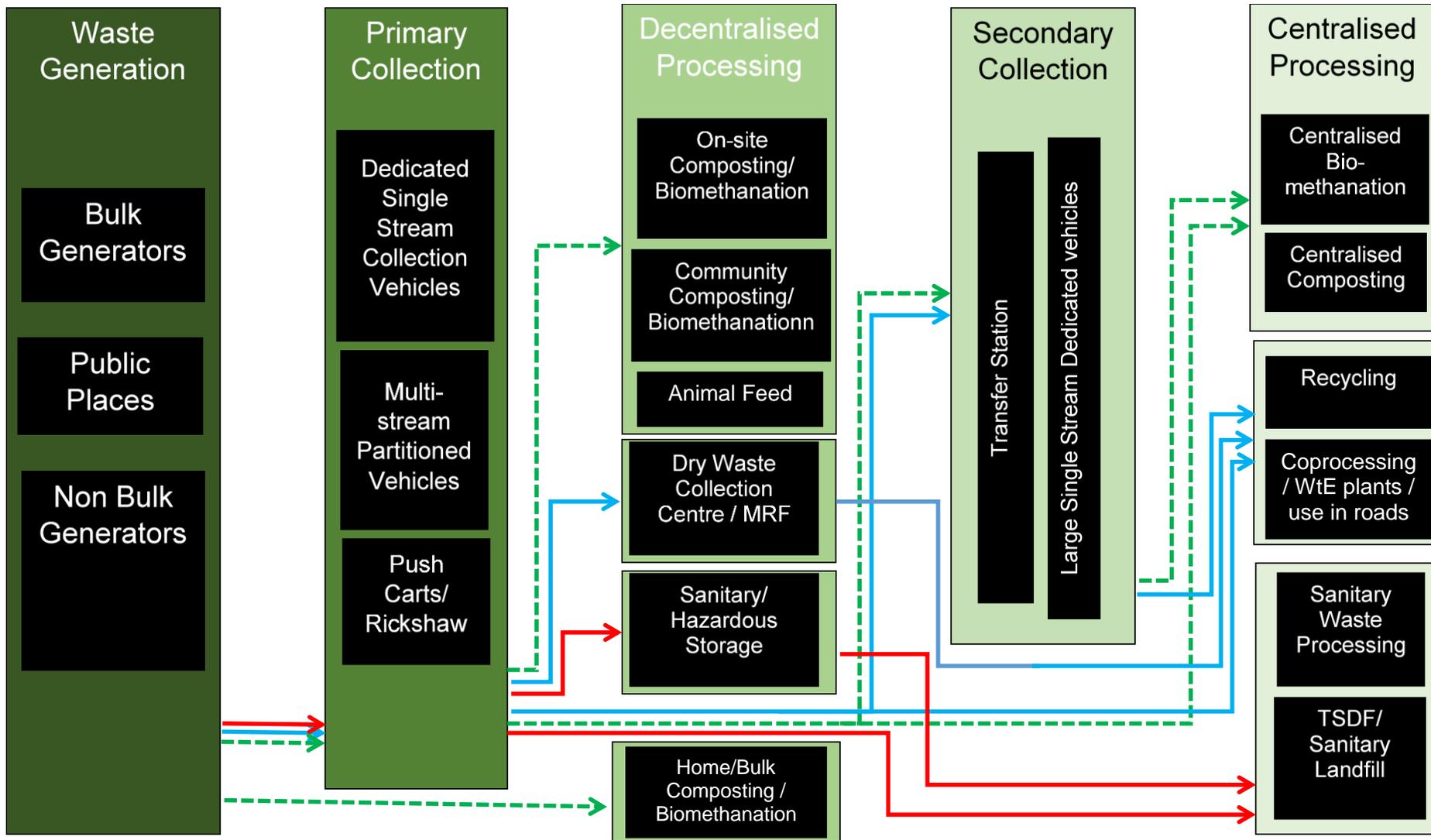
The Government affirms overall solid waste management strategy in the State of Karnataka will be based on:

1. **Segregation at source and during transportation:** effective implementation of segregation of waste at source by all waste generators, and at all levels and scale. In this manner the State Government will endeavor to raise consciousness of the wide public on the importance of taking responsibility of the waste they generate and to segregate waste into three streams i.e. biodegradable, non-biodegradable and domestic hazardous waste (including sanitary waste). In addition, supporting infrastructure to ensure segregated waste is collected and transported to appropriate relevant processing facilities will be set up by the Urban Local Bodies.
2. **Reduction in waste:** The Government will strive to raise awareness of the people to pay particular attention to the increasingly large amounts of waste generated every day and of the critical need to consume less and change certain behaviours so that less waste is generated. The State Government also affirms its resolve to systematically advocate the importance of taking responsibility for minimization of waste through the network of its agencies and in collaboration with Urban Local Bodies.
3. **No open dumping and burning:** Open burning and dumping of municipal solid waste anywhere will be effectively tackled, and penal action initiated against violators. Consequently, the State Government will ensure technology that incentivizes a culture of disposal of waste and/or promotes incineration of unsegregated waste is assessed with caution and in accordance with prescribed legal parameters given its possible adverse impacts on environment and health.
4. **Decentralised waste management systems:** Decentralised means establishment of dispersed/local facilities for maximizing the processing of biodegradable waste and diversion of recyclables closest to the source of generation so as to minimize transportation of waste for processing or disposal and for maximum recovery of resources. The State will endeavor to ensure all waste produced is managed locally, by ensuring organic component of the waste is composted locally (particularly within homes, apartments and residential layouts), recyclable waste recovered, and inert/non-recyclable waste which cannot be co-processed or otherwise processed alone is landfilled.
5. **Health, safety and dignity:** The State Government and Urban Local Bodies will ensure the health, safety and dignity of every person and stakeholder involved in handling municipal solid waste in all respects.

6. **Emphasis on processing of waste:** The State Government and Urban Local Bodies shall emphasise on not only 100% door to door collection of waste but also processing of waste such that resources can be recovered from municipal solid waste. In this respect, the state and local government will set up appropriate number of recycling, bio-methanation, compost, refuse derived fuel (RDF) units and other processing facilities across the state.
7. **Decentralised governance:** To ensure best waste management practices become systemic to local governance, Town Panchayats, Municipal Councils and Municipal Corporations and City Corporations will be required to develop plans and strategies that will ensure Ward Committees and Area Sabhas, and such other units of local self governance, employ appropriate practices, processes and technologies of waste management that will cause no adverse fallout on workers, environment and public health.
8. **Promotion of livelihoods:** Every local government will be encouraged to promote livelihood opportunities from waste management activities.

C. **TYPICAL FLOW OF SOLID WASTE**

For the reference of all Urban Local Bodies, the figure below describes the flow of solid waste (excluding special wastes such as slaughter house waste etc.) from generation to disposal including all the intermediate steps/activities such as primary and secondary collection, secondary segregation, processing (such as composting, bio-methanation, recycling refuse derived fuel and waste to energy processes) and disposal in landfills. This includes both centralised and decentralised processing systems for different waste streams.



Green: Biodegradable waste

Blue: Non-biodegradable waste

Red: Domestic hazardous waste (including sanitary waste)

Waste Generation	Primary Collection	Decentralised Processing	Secondary Collection	Centralised Processing <sup>1</sup>
<p><b>Bulk Generators:</b></p> <ul style="list-style-type: none"> <li>• Apartments; institution, offices; malls, marriage halls; hotels, restaurants; markets, religious places.</li> <li>• Bio degradable waste to be managed on-site as far as possible. Other streams to be managed by the ULB for a specified period and thereafter taken over by empanelled private agencies.</li> <li>• To be registered and need to self declare waste generation, collection and processing data to the ULB. ULB to check periodically.</li> </ul> <p><b>Public Places:</b></p> <ul style="list-style-type: none"> <li>• Railway stations, bus stands; street sweepings; parks; public</li> <li>• Largely wet and dry waste is generated. Likely to have mixed waste due to floating population and lack of accountability.</li> <li>• Will require daily collection.</li> <li>• Public sensitisation through strong messaging &amp; close monitoring through cameras and fining.</li> </ul> <p><b>Non Bulk Generators:</b></p> <ul style="list-style-type: none"> <li>• Residential layouts; small shops and offices; slums</li> <li>• Quantity per unit will be less hence time per kg of collection will be high.</li> <li>• Collection Kiosk and/or point to point collection in congested areas with small houses/shops.</li> </ul>	<p><b>Stream specific large dedicated vehicles with GPS:</b></p> <ul style="list-style-type: none"> <li>• Most suitable for bulk generators for collecting large quantity of waste from each location.</li> <li>• Can also be used for specific type of waste such as food waste from restaurants for biogas plants; slaughter house waste; dry and sanitary waste from bulk generators, schools and colleges.</li> </ul> <p><b>Partitioned vehicles with GPS:</b></p> <ul style="list-style-type: none"> <li>• The partition should be such that both openings are on one side for quick and easy disposal.</li> <li>• Most suitable for areas where all 3 categories must be collected daily such as residential areas.</li> <li>• Route planning with actual run in the localities must be done to fix the collection time.</li> <li>• Best used in congested, densely packed localities where vehicle speed would not be an advantage.</li> <li>• To be supported by secondary collection vehicles to regularly transfer waste.</li> </ul> <p><b>Push cart/ Rickshaw:</b></p> <ul style="list-style-type: none"> <li>• Must have separate bins/bags for the three waste categories.</li> <li>• Should be made of light material; easy to manoeuvre.</li> <li>• Best used in congested, densely packed localities where vehicle speed would not be an advantage.</li> <li>• To be supported by secondary collection vehicles to regularly transfer waste.</li> </ul>	<p><b>Community/Onsite Composting/ Bio-methanation:</b></p> <ul style="list-style-type: none"> <li>• Community units are typically 1-5 tons per day set up &amp; are typically managed by the ULB at ward/block level for waste from non-bulk generators.</li> <li>• Onsite compost and/or biogas plants can be set up by bulk waste generators within their premises for onsite processing.</li> </ul> <p><b>Animal Feed:</b></p> <ul style="list-style-type: none"> <li>• Biodegradable Waste can be considered as an option for animal feed and the ULBs must ensure the process is closely monitored to ensure no spread of disease and compliance of applicable standards.</li> </ul> <p><b>DWCC/MRFs:</b></p> <ul style="list-style-type: none"> <li>• DWCCs are typically 1-5 tons per day facilities set up and managed by the ULB for dry waste.</li> <li>• MRFs are large mechanised dry waste handling facilities (&gt;10 tons per day). This leads to less labour &amp; larger volumes where even low value material can be profitably handled. The facility should have conveyor belts for sorting &amp; bailers.</li> <li>• The dry waste is sorted and recyclable waste is sold and/or sent for recycling directly while non-recyclables could be aggregated for further processing such as co-processing.</li> </ul> <p><b>Sanitary/ Hazardous Storage Facility:</b> Sanitary &amp; domestic hazardous waste gets aggregated at these facilities &amp; transported in larger vehicles to end destinations for disposal</p> <p><b>Home Composting:</b> Municipality must encourage home composting especially for large houses (2000 sqft and above)</p>	<ul style="list-style-type: none"> <li>• This is to be built only if the processing facility is more than 7 km from the primary collection areas where the waste should be transferred into a larger secondary transfer vehicle/station such as tractors or tipper trucks.</li> <li>• No mixing of waste and manual waste handling during transfer and transportation to appropriate processing facilities. <b>To avoid mixing, the secondary collection vehicles could be single stream vehicles.</b></li> </ul>	<p><b>Centralised Bio-methanation:</b></p> <ul style="list-style-type: none"> <li>• Large centralised biogas facilities (&gt; 50 tons per day) can have gas bottling plants that can significantly improve the return on investment of the facility.</li> </ul> <p><b>Centralised Composting Plants:</b></p> <ul style="list-style-type: none"> <li>• Large composting plants can be mechanised reducing the manpower requirement.</li> <li>• The compost would also be more accessible for farmland in the out skirts of the city/town. The compost should comply with applicable standards.</li> </ul> <p>These facilities are typically set up away from the population with the required buffer zones.</p> <p><b>Recycling</b></p> <ul style="list-style-type: none"> <li>• The recyclable fraction of dry waste should be sent to appropriate recycling plants for different categories such as paper, plastics, glass, metal etc.</li> </ul> <p><b>Non recyclables for Co-processing/WtE plants/plastic in roads:</b></p> <ul style="list-style-type: none"> <li>• The non-recyclable fraction can be sent to RDF units, co-processing and/or WtE plants.</li> <li>• Use of plastic in roads should also be explored.</li> </ul> <p><b>Sanitary waste processing:</b></p> <ul style="list-style-type: none"> <li>• Nearest common biomedical waste treatment facility</li> <li>• Deep burial</li> <li>• Approved incinerators</li> </ul> <p><b>TSDF / Sanitary Landfill :</b></p> <p>Domestic hazardous waste such as paints and chemicals must be disposed at TSDF or sanitary landfills.</p>

<sup>1</sup> \* These facilities are typically set up by the ULB, by private parties and/or on PPP model. The private parties involved in processing should have proven expertise.

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## D. GOVERNANCE OF SOLID WASTE MANAGEMENT SYSTEMS:

1. The Deputy Commissioner will ensure that every urban local within the district has a duly approved solid waste management plan in consonance with this Karnataka State Urban SWM Strategy, Karnataka State Urban SWM Policy and as per the timeline proposed in **annexures**, and take steps to implement them. The SWM plan would include strategies for collection and processing of different waste streams, budgets detailing capital and operational costs of supporting human resources, maintaining transport infrastructure, financial viability of such waste management systems, plan for bulk waste generators, details of monitoring systems among others as set out in **Annexure A**. The emphasis would be on handling and processing waste in accordance with guidelines prescribed as a part of this strategy and as per guidelines annexed.
2. In the case of City Corporations and City Municipal Corporations, micro-plans for solid waste management at the Ward level will be prepared which will be a part of the broad SWM plan for the ULB. All such plans will be on permanent public display and will be accessible in every office of Urban Local Bodies, particularly at the level of Wards, for public review and education.
3. All District/Metropolitan Planning Committees shall in consultation with designate planning and governance authorities such as Municipalities, Town and Country Planning agencies, Development Authorities, Industrial Town Committees, Tourism Authorities, Temple Town Committees, etc., will take necessary steps to prepare comprehensive solid waste management plans at the district level that will include specifically the areas of convergence (including with rural areas), common regional facilities (including availability of land and management of the facilities), dovetailing of various funds available at the district level among others. It shall be ensured that members of public are involved in the finalization of the District Solid Waste Management Plans. Budgets developed to implement such plans will be submitted to the State Finance Commission for approval within a year of this policy coming into effect.
4. All bodies corporate, be they in the public or private sectors, in the nature of business establishments and manufacturing entities, FMCG companies, and any corporate organisation and entity that deals with consumer products, and where the consequence of the use of such products generates plastic waste, will be required to recover such plastic waste as per the Extended Producer Responsibilities mandated in the Plastic Waste Management Rules 2016 and such other norms as the State Government prescribes from time to time. These entities shall also be required to promote sustainable packaging that is environmentally safe and practices that have intent of reducing waste to the most minimum.
5. All district environmental authorities and district offices of the Karnataka State Pollution Control Board will extend all necessary technical assistance to Urban Local Bodies Governments within their jurisdiction in a time-bound manner.
6. In special circumstances, and in ecologically sensitive areas, more specific guidelines will be issued by the District administration and will be adhered to in coordination with Local Governments.

## E. ROLE AND MANAGEMENT OF LABOUR IN SOLID WASTE MANAGEMENT:

1. Recognising the untiring services rendered by Pourakarmikas over decades in protecting the health of citizens, the Deputy Commissioner/Commissioner, BBMP in coordination with the District Labour Officer/any other competent authority will ensure all applicable norms relating to protection of labour rights, be they in the nature of wage rights, occupational health, welfare measures and such other rights of Pourakarmikas and other labourers, will be implemented by Urban Local Bodies, subject to following norms:
  - (i) All workers involved in handling waste, be they in the direct employment of local governments, or contractually employed in any form, and also those who are in the unorganized sector, shall be

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assisted in handling waste as per applicable public health, occupational health and labour norms. This is to ensure that under no circumstances are they allowed to handle waste in a manner that could be hazardous to their health, well-being and dignity.

- (ii) Considering that a majority of the workforce engaged in solid waste management primarily are from the historically, economically and socially oppressed scheduled castes and scheduled tribe communities, the Government resolves to secure economic and social upliftment of these workers.
- (iii) The services of cleaning, waste collection, transportation, sorting, disassembly, processing, recycling, which are obligatory functions of the local bodies, will be considered as environmental services to guarantee environmental and public health for all. All involved in these tasks will be technically trained and their competencies updated periodically to elevate the status of such jobs to the professional standing that they deserve.
- (iv) It shall be ensured that all steps would be taken forthwith to ensure Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013 and that the law is strictly implemented in its letter and spirit. In this manner the State Government resolves to comprehensively attack and disallow the inhumane practice of manual scavenging.

### F. DECENTRALISED WASTE MANAGEMENT SYSTEMS

Decentralised waste management systems involve the waste generator and/or communities managing their waste in their premises or locality/neighbourhood. These systems are sustainable primarily because of the following reasons:

- (i) Maximum recovery of resources is possible if the waste is processed onsite i.e. where waste is managed locally by those who generate it. This is mainly due to (a) reduction in the possibility of mixing of different waste streams; and (b) reduced volumes of waste which results in specialised segregation of dry waste and in turn, efficient recycling and processing. This in turn results in significant savings on costs spent on sorting mixed waste and recovery of maximum resources from waste.
- (ii) Decentralised processing systems rely on minimal transportation of solid waste; therefore, there is considerable reduction in costs due to transportation. Due to significant reduction in transportation of solid waste under decentralized waste systems, the financial costs as well as environmental impact (due to emissions and use of fossil fuels) are far more sustainable compared to those of centralized waste processing.
- (iii) Given the scale of the decentralized systems, the costs towards infrastructure are much lesser than those of centralized waste processing and disposal facilities. In addition, the environmental clearances and approvals for smaller processing units are lesser as compared to large processing units and therefore, the possibility of such units being delayed or stalled by lack of approvals and public outcry are reduced.
- (iv) There is increased public participation, transparency and accountability if waste generators are aware of how their waste is being processed and disposed. Therefore, these systems encourage public acceptance and participation in waste management systems, which have often met with protests and objections.

Therefore, to the extent space is available within the ULBs, decentralised waste processing systems especially for biodegradable waste should be encouraged. This is partly being incorporated by making in-situ

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processing of biodegradable waste mandatory for bulk waste generators, which is discussed later in this strategy.

### **G. REVIEW**

The Karnataka State Urban SWM Strategy will have to be reviewed and amended at least every two years (or earlier, if there it is deemed necessary by the government), in order to accommodate the new innovations and research on processing of solid waste management and any other developments that are relevant in the waste sector.

# **ANNEXURES**

# Karnataka State Urban SWM Strategy

## ANNEXURE A: APPROPRIATE PLANNING, DEVELOPING INSTITUTIONAL MECHANISMS AND FINANCIAL GUIDELINES FOR SOLID WASTE MANAGEMENT

Waste management requires proper planning, budgeting and implementation strategy to ensure that the services are provided efficiently and in an uninterrupted manner. The responsibility of preparation and implementation of solid waste management plan lies with the chief executive officer and/or head of the ULB, through the solid waste management (SWM) department/cell of the ULB, if any. This annexure provides strategic guidelines for an effective and efficient implementation by the administrative bodies of the State and the local bodies of solid waste management.

### 1. Planning

- 1.1. Every urban local body has to carry out comprehensive planning by assessing the present status through ground level surveys, conduct a gap analysis and requirements in the existing solid waste management system along with future projections and put in place detailed project reports (“DPR”) with targets which are realistic and achievable. There should also be a detailed review and analysis of national, state and municipal levels laws, rules, policies and programs related to SWM. The planning should involve stakeholder consultations and identification of the stakeholders’ roles and responsibilities.
- 1.2. The plans and DPR so devised should be short term plans spanning 2-5 years and reviewed thereafter. Long term plans may extend to a 25 year period. Short term plan should cover institutional strengthening, community mobilisation, waste minimisation initiatives, waste collection and transportation, treatment and disposal, workers welfare and informal recycling sector integration along with financial outlay based on requirement of funds for the projects identified.
- 1.3. The plans and reports must be in compliance with the SWM Rules 2016, and in alignment with the respective State Sanitation Strategy under the National Urban Sanitation Policy, and follows the principles of circular economy, and waste hierarchy from the most preferred action which is reduce, reuse, recycle or compost, other forms of recovery before final disposal.
- 1.4. The plans must encompass – institutional strengthening, human resource development, technical capacity building, financial viability and arrangements, community partnerships, legal framework and mechanisms for enforcement, information education and communication, public grievance or complaint redressal. The plans must also address integration of informal sector and the importance of protection of livelihoods.
- 1.5. The SWM plans should specifically:
  - (i) Incorporate strategies for waste minimisation and management
  - (ii) Create better information systems , validated key base data like population, households, area maps for effective implementation
  - (iii) Ensure estimation of waste generated and waste characterisation through quarterly surveys to assist in correct capacity design
  - (iv) Ensure complete coverage of all waste generators including households, commercial establishments, places of worship, government institutions, defence areas, railways, airports, bus terminals, industrial townships, educational institutions, tourist areas among others.
  - (v) Convergence with rural areas and Gram Panchayats as required
  - (vi) Ensure that the legacy waste on land and in water bodies is addressed
  - (vii) Address special wastes which include domestic hazardous waste and other special waste streams.
  - (viii) Set year wise operational targets with a time bound plan of the waste management activities and indicate the means to achieve them.

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- (ix) Provide for contingency plans for appropriate collection, storage and processing of waste during or after force majeure events such as natural disasters, epidemics, pandemics or due to non-performance or closure of processing/treatment/disposal facilities for any reason.
- 1.6. ULBs are required to prepare a DPR for solid waste management within their jurisdictions which can specifically include a financially viable model for implementation of SWM plan in a timely and efficient manner while ensuring environmental protection and public health. The major sections that should be covered in a DPR are:
- (i) Context setting, area demographics and waste data. The waste data should include quantification and characterisation/composition taking into account daily, seasonal and temporal fluctuations. The methodologies for baseline assessment for waste generation and characterisation should be well established and ULBs can refer to Municipal Solid Waste Management Manual, CPHEEO, Ministry of Housing and Urban Affairs for such methodologies.
  - (ii) Objectives and scope of the project
  - (iii) Approach, methodology and guiding principles
  - (iv) Status of existing resources and gap-analysis with respect to requirement of land, manpower and equipment
  - (v) Details of service provision including time-lines, areas covered, machinery and manpower requirement, etc.,
  - (vi) Inputs/ buy-in from local community
  - (vii) Techno-economic and life cycle assessment of suitable alternative technologies
  - (viii) Case study of other similar successful projects, if available
  - (ix) Regulatory framework for implementation
  - (x) Estimate of costs involved in service delivery and financing models
  - (xi) Roles and responsibilities of stakeholders
  - (xii) Operation and maintenance framework and costs
  - (xiii) Sustainability of the SWM plan
  - (xiv) Social and environmental impact assessment of the processing technologies
  - (xv) Mode of service delivery - service to be provided by the ULB staff or staff contracted by the ULB or through private sector participation
  - (xvi) Technology enabled real-time monitoring of the SWM service

The State High Powered Committee/competent authority shall approve the DPR after it has been technically and economically appraised by authorised institutes/agencies/consultants with relevant expertise in solid waste management.

- 1.7. The solid waste management plan and detailed project report should be submitted to DMA or agency authorised by the State Government within 6 months of notification of this strategy. Such plans and reports should be reviewed at least once in two years for assessing progressive improvements, long term assessment (bearing in mind increase in population and income) to quantify and characterise the type of waste generated to accurately evaluate the existing and required infrastructure and manpower as per normative standards issued by the state from time to time and other ground level parameters.

## 2. *Institutional Mechanism*

In order to enable the effective carrying of the plan and activities under DPR, roles and responsibilities of various authorities agencies at different levels of governance need to be identified. Set out below are the different authorities, agencies and officials at the state, district and levels which are responsible for SWM activities.

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## 2.1. State level

- (i) State High Powered Committee (SHPC) headed by Chief Secretary constituted under SBM (Urban) guidelines or any other committee under subsequent regulations.
- (ii) State Level Advisory Body (SLAB) headed by Additional Chief Secretary under SWM Rules/City Compost Steering Committee/State Level Monitoring Committee under PWM Rules.
- (iii) Additional Chief Secretary, UDD
- (iv) Secretary, UDD
- (v) Directorate of Municipal Administration (SWM Cell)
- (vi) Head of town planning department
- (vii) Head of planning authority.

The following shall be some of the responsibilities assigned at the state level which could also be delegated to the district level officers as feasible:

- (i) To empanel consultants for preparation of DPRs, authorise institutes for appraisal of DPRs approve DPR and financial model of SWM and sanction projects
- (ii) To review the matters related to implementation of SWM Rules, state policy and strategy on SWM and give advice to the state government
- (iii) To examine the technical feasibility of the DPR submitted by the ULBs
- (iv) To review action plans and to review progress of SWM projects

## 2.2. District level: Similarly, at the district level, the following agencies and officials are responsible for implementation of SBM (Urban) Guidelines in the ULBs (except BBMP):

- (i) Deputy Commissioner
- (ii) Project Director (District Urban Development Cell)

## 2.3. At the ULB level: The specific responsibilities of each of ULB officials are given below<sup>2</sup>:

- (i) Municipal Commissioner or executive of ULB and in the case of BBMP, BBMP, Commissioner/Special Commission (SWM): Responsible and accountable for overall preparation and implementation of SWM plan and other critical activities under the SWM Rules 2016 and this Karnataka State Urban SWM Strategy.
- (ii) Head of the SWM department/cell in the ULB: While the ULBs in Karnataka do not have a separate SWM department for overseeing and implementing SWM activities within the ULB, it is recommended that such a department/cell/wing should be created and manned by experienced and qualified personnel (that have experience in technical, logistical, operational and contract management). The SWM department/cell/wing will be responsible for establishing the baseline and analysing gaps in SWM service provision, coordinating various departments and stakeholders to be involved in development and implementation of SWM plan and DPR, monitor solid waste management service provision among others.
- (iii) Health officer (until such time a separate cell/department is set up for SWM activities): Responsible for field level monitoring of segregation, collection and processing of solid waste within the ULB.
- (iv) Environmental engineer
- (v) Health/sanitary inspectors
- (vi) Heads of water supply, public health or sanitation, and sewerage departments: Responsible for exploring potential cross-linkages and advise the SWM plan processes.
- (vii) Head of accounts department: Advice on potential revenues, costs, and implementing practices for

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<sup>2</sup> SWM Manual, Part II, Section 1.4.4.1.1, page 50

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appropriately recording SWM revenue and expenditure.

- 2.4. In addition to the above, nodal officers/consultants shall be appointed at ULB, District and State Level as responsible officer for implementation of obligations under the Karnataka State Urban SWM Strategy. The District Level Technical Committee constituted under SBM (Urban) guidelines shall act as advisory teams to ensure proper discharge of solid waste management functions and services, to monitor the SWM activities and effective implementation of the Karnataka Urban SWM policy and this strategy. The ULBs can appoint “Green cops/Marshals” to regulate SWM activities/levying of spot fine/unauthorised waste dumping among others and these personnel shall
- 2.5. There shall be involvement of the external stakeholders like community comprising households, recycling sector, municipal workers, non-government organisations, civic body organisations, waste management agencies, self-help groups, worker organisations and industry representatives etc in the solid waste management planning and implementation
- 2.6. There shall be interdepartmental coordination to carry out convergence of urban-rural waste management, dove-tailing of various funds for waste management, social welfare and benefit schemes for the benefit of the sanitation workers and the waste pickers.
- 2.7. On the basis of the principles set out in this Karnataka State Urban SWM Strategy, the human resource utilisation guidelines shall be issued by the State Urban Development Department (UDD). These guidelines will cater to different categories of urban local bodies indicating organisational structure, allocation of responsibility and accountability for effective implementation of the solid waste management plans and DPRs:
  - (i) The guidelines shall identify the overall SWM organisational hierarchy of the various implementing bodies, nodal agencies/departments and officers at the district and ULB level
  - (ii) The guidelines shall specify the structure of the SWM cell /Department to be set up in every ULB per size, designation and number with minimum number advised for every role and responsibility. The total sanctioned posts at the SWM cell/department shall be updated as per guidelines to be issued by UDD periodically
  - (iii) The criteria for selection, qualification/entrance exams/number of health inspectors, environmental engineers, supervisors, pourakarmikas and other personnel for each role of SWM implementation shall be laid out.
  - (iv) The guidelines shall also specify the tenure, transferability and timeline for filling of vacancies. However, it is critical that the team executing SWM projects at ULB and district levels remains engaged in the project for the long term and frequent transfers of such officials shall be avoided. The tenure of the personnel involved in SWM activities shall typically be for three to five years. This would ensure a dedicated staff and better accountability.
- 2.8. The ULBs must ensure procurement of suitable equipment to facilitate source segregation, primary collection vehicles (auto tippers and equivalent ) with separate compartments /partitions to collect wet and dry waste separately the equipment may be either procured through GeM portal for ease of buying, if the proposed equipment/vehicle not available with GeM, then ULB can procure it through tendering procedure.

### *3. Planning manpower and vehicles for collection of solid waste*

- 3.1. **Primary collection:** The door to door primary collection of segregated solid waste will be carried out by the ULB from the doorsteps and / or entry gates of households (including multi storied buildings or apartments), shops, institutions, commercial establishments, offices, slums and informal settlements. In addition to door to door collection of solid waste, the ULB shall collect solid waste from public spaces such as parks, bus and railway stations, tourist spots, gardens and similar areas at specified times and days. For a more accurate idea of manpower and vehicle requirement, the ULB should consider type and points of waste generators for door to door collection instead of just the number of waste generators or area of the ward. For example, a locality with many multi dwelling units would have lower number of ‘point of collection’ but

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the time taken and the quantity of waste per point of collection would be higher, therefore, requiring longer handling time and additional space in the collection vehicles.

- 3.2. **Frequency of collection:** The wet and sanitary waste should be collected every day, however, in case of ULBs with sparse population, hilly terrain, areas with adverse climatic conditions such as heavy rainfall, the frequency of door-to-door collection can be determined by the ULB, which ensures no dumping or burning of waste by the generators. It will be the responsibility of the primary collection staff to monitor and report to the sanitary or health inspector the waste generators that are not segregating their waste at source. The primary collection staff should also systematically report on non-compliance by generators along with local dumping / burning of waste.
- 3.3. **Collection route:** After deciding the 'points of collection', the collection frequency of each stream of waste and a detailed collection route needs to be finalised and made available in public. This waste collection route planning is critical to ensure an efficient door to-door collection and transportation system. In order to carry out door to door collection, area-wise specific time slots including relevant day of the week for different categories of solid waste should be notified by the ULB and published at prominently visible parts of that area, at ration shop and milk / water booths, post offices and ATMs, on the website of ULB and any other place as may be considered appropriate by the ULB. In addition, route maps for collection including stops, starting and ending times and other relevant details could be provided along with the time slots.
- 3.4. **Ward micro plan:** In furtherance of decentralized waste management systems, micro plans for waste management should be prepared at the ward level for City Corporations. For this, the City Corporations should carry out a mapping of every ward and identify the total population of every ward including number and type of waste generators such as households, shops, markets, commercial establishments and offices, bulk waste generators etc. Thereafter, a ward wise map which set out of the blocks of waste generators for collection of waste should be created. This plan should identify the number of collection points, route, collection schedules along with equipment and manpower required to ensure reliable, efficient and segregated collection of waste. The City Corporations should geo-fence the block if possible and provide for mustering points for biometric attendance of pourakarmikas/SWM workers.
- 3.5. **Assessment of collection infrastructure:** The ULB shall assess the number of vehicles, push carts and Pourakarmikas/ SWM workers that will be allotted to each ward for efficient collection of solid waste and to ensure that there is no inter-mixing of segregated solid waste. This may be re-evaluated from time to time by the ULB depending on the change in the number of waste generators, quantity and type of waste generated and other factors.
- 3.6. **Selection of vehicles and manpower:** The selection of vehicles by the ULB for collection of waste should depend on terrain of the locality, width of streets, population density and quantities of generated waste to be collected. The ULB should deploy different suitable vehicles for collection of solid waste including auto-tippers, pushcarts or vehicles having separate compartments for carrying bio-degradable, non-biodegradable waste and domestic hazardous waste. The motorised collection vehicle shall be enabled with live and / or GPS tracking to ensure monitoring of collection and deposit of segregated solid waste at their assigned destinations. The normative standards has proposed one auto tipper for every 1000 households / commercial establishments and one driver and helper for each auto-tipper. In narrow streets that cannot be serviced by auto tipper or the vehicle, a smaller motorized vehicle or a tricycle having separate compartments for carrying bio-degradable, non-biodegradable waste and domestic hazardous waste shall be deployed. In smaller, narrow and congested streets / lanes where even such smaller motorised vehicle cannot operate, the ULB shall assign appropriate manually driven push carts for collection of solid waste. The pushcart must be made of light material and ergonomically designed with preferably large wheels for uneven roads. The normative standards have proposed one pushcart with 6 bins for every 200 households/commercial establishments and one pourakarmika for such pushcart. In the event the vehicles are not partitioned,

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separate days shall be designated for collection of bio-degradable, non-biodegradable waste and domestic hazardous waste to ensure that there is no mixing of different categories of solid waste. This is essential to ensure that wastes are not mixed during transportation. The vehicles used for transportation of solid waste shall be covered in such a manner that the collected waste is not exposed to open environment, visible to the public and scattered on the road and / or pavements during transportation. Ideally, the design of the primary collection vehicles should be such that it has a tipping facility to avoid manual handling of waste and such waste should not touch the ground until the final processing/disposal sites.

- 3.7. **Secondary transportation:** In the event the processing facility is more than 7 km from the primary collection areas, the waste should be transported to a larger secondary transfer vehicle such as compactors or tipper trucks and/or secondary storage/transfer facilities. There shall be no mixing of waste and manual waste handling during transfer and transportation to appropriate processing facilities. To avoid mixing of waste, the ULB could consider separate secondary vehicles for bio-degradable and non-biodegradable (and domestic hazardous waste, if necessary) wastes, as required. All transportation of waste shall be carried out in covered vehicles to prevent spillage of solid waste or leachate enroute to processing and disposal facility.

### 4. *Capacity building*

- 4.1. There are different levels of staff who are involved in solid waste management at the ULB level i.e. **(i)** pourakarmikas (including loaders, cleaners and helpers) and drivers, **(ii)** supervisors, sanitary inspectors, health inspectors and assistant engineers, **(iii)** executive engineers, health officers and other management personnel supervising the SWM plan, **(iv)** elected representatives of city/town, and **(v)** other stakeholders. They require specialised training that is different in scope, duration and specialisation. For example, pourakarmikas shall be trained about door-to-door collection, proper methods of waste management such as segregation and collection, use of tools and equipment, expectation of the public among others. While the drivers shall be trained about vehicle maintenance and preventive checks. The supervisory staff shall be given training regarding human resource development, rules and regulations relating to waste management, MIS systems and technologies involved in handling and management of waste. The senior level officials shall be kept updated on the latest developments and trends in the waste management sector, planning and processes around management of waste, rules and regulations around waste management. Therefore, ULBs must prepare a capacity building plan with specific training modules for each level and mandatory training of all personnel involved in solid waste management. This is to ensure maximum productivity, efficient use of resources and high motivation among the workforce.
- 4.2. State Institute of Urban Development (SIUD) and/or Environmental Management and Policy Research Institute (EMPRI) shall be the nodal agencies to develop training modules/ content and provide training and capacity building to all SWM staff. SIUD and EMPRI can enlist the assistance of solid waste management practitioners, experts and other institutions working with municipal workers and informal recycling sector for developing the modules. The state can review the selection of the nodal agency as per its performance on an annual basis and make necessary changes as it deems appropriate.
- 4.3. In addition the local body shall carry out the training or e-learning and training modules under various Government of India programmes including those prescribed by the MoHUA from time to time under the SBM (Urban), Green Skill Council and /or any other competent authority to be completed by all SWM personnel.
- 4.4. The ULBs shall also consider measures such as deputation of personnel to larger ULBs to undergo field training and for gaining relevant experience.
- 4.5. The capacity building exercises will also have to be undertaken for elected representatives, citizen volunteers, informal waste workers and other NGOs/CBOs working on waste management or community mobilisation.

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- 4.6. The state government and ULBs should earmark sufficient amounts for training and capacity building of all levels of staff at regular intervals and capacity building. It should be reflected in state and ULB budgets. This would depend on the number of staff, length of training, external agencies involved in the training, location and frequency of the training among other factors.

## 5. *Financial Management*

- 5.1. **Budgets for SWM services:** ULBs face unanticipated problems during the implementation of solid waste management systems due to poor budget estimation at the time of planning i.e. the gap between the planned cost and the actual cost of implementation. Therefore, when planning for solid waste management system, critical emphasis should be given to full accounting of costs and ensuring that the system is economically strengthened and is self-sustainable after a specified period. In addition, when planning for solid waste management system, critical emphasis should be given to full accounting of costs and ensuring that the system is economically strengthened and is self-sustainable after a specified period. In this context, the ULBs need to prepare two kinds of budgets; **(i)** budget for capital expenditure and **(ii)** budget for annual operations.

- (i) **Budgeting for Capital Expenditure:** The typical components of capital expenditure budget are:
- (i) Land cost for setting up temporary storage, transfer stations, processing facilities (decentralised and centralised) and scientific landfill etc.
  - (ii) Building and civil works
  - (iii) Utilities such as water connection, power supply, effluent treatment plant, stack monitoring set up, rainwater harvesting, power back up among others
  - (iv) Equipment and vehicles for material handling, primary and secondary transportation and processing
  - (v) Equipment for street sweeping, drain cleaning and vegetation cleaning.
  - (vi) Testing and monitoring equipment for environmental and other impact. This would be operational expenses if the ULB leases these equipments periodically.
  - (vii) Information communication technology for capture and processing of data, communication and process monitoring.
  - (viii) Providing viability gap funding for PPP projects
- (ii) **Budgeting for Revenue/Operating Expenditure:** The typical components of operating expenditure budget are:
- (a) Overall program management cost such as salaries of health officers, environmental engineers and other management level ULB officials in charge of SWM activities.
  - (b) Fuel for the primary and secondary transportation vehicles
  - (c) Utility cost such as power and water etc., for processing and other infrastructure
  - (d) Vehicle and equipment maintenance
  - (e) Financial cost such as depreciation, interest on debt, insurances, bank guarantees etc.
  - (f) Recurring costs towards information technology and communication
  - (g) Consumables such as personal protective gear, chemicals uniform and shoes etc.
  - (h) Replacement of lost/ damaged bins and consumables
  - (i) IEC activities
  - (j) Direct and contracted/outsourced staff cost for:
    - for primary and secondary collection such as pourakarmikas (direct and contract), drivers, helpers, cleaners, loaders, supervisor, etc.
    - sweeping and drain cleaning
    - secondary sorting and handling of waste material
    - waste processing and disposal such as plant operators, workers, security guard etc.

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- (iii) While planning for sources of finance, ULBs should endeavour to plan in a way that funds are always available for **(a)** operation and maintenance costs of waste management systems and **(b)** meeting replacement cost of equipment, vehicles, machinery at the end of their lifetime. This is especially critical because collection and processing equipment is relatively short-lived and operating and maintenance costs are substantial. In addition, there should budgeting for working capital costs which typically are equal to at least two months of O&M costs and interest on receivables and revenue for two months. ULBs should also be cautious in preparing O&M estimates and care should be taken to ensure that SWM O&M cost should not be more than 1/3<sup>rd</sup> of the total ULB budget.
- (iv) The budget should also include monitoring activities such as inspection, surprise checks, collection of fines etc.

### 5.2. Sources of Funding:

- (i) The main **internal sources** of revenue for the ULB from SWM operations are (a) SWM cess to be collected along with property tax and SWM service charges which could be collected separately or as part of the property tax and/or in any other method deemed fit by ULB. For example, BBMP has entered agreement with BESCOM for collection of monthly SWM service charges along with electricity charges. (b) revenue from sale of recyclables and by-products from SWM processing such as compost, biogas, RDF etc (if the facility is directly operated by the ULB), and (c) fines and penalties. In addition, the ULB shall ensure collection of SWM service charges from governmental premises, public gatherings, tourist places, industrial townships, areas under the control of Indian Railways, airports, airbases, ports and harbours, defence establishments, special economic zones etc within the jurisdiction of the ULB.
- (ii) The main **external sources** of revenue for the ULB are (a) grants from Central and State government such Central and State Finance Commission grants, Swachh Bharat Mission grants, AMRUTH, Smart City funds; (b) loans facilitated from financial institutions and banks; (c) state facilitated funding and assistance multilateral donors like Asian Development Bank, German Development Bank (KfW), the World Bank in accordance with applicable guidelines; (d) Corporate Social Responsibility(CSR) funds; and (d) public-private partnerships. The availability of grants should be utilised annually to ensure the necessary asset creation as per the Short term plans.

Financial sustainability is crucial for solid waste management systems to be run efficiently as lack of funds has been cited as one of the biggest issues resulting in mismanagement of solid waste. In this context, ULBs should reduce dependence on external sources of funding and focus on making the SWM financially viable through internal sources of revenue and efficient operations. The ULBs should also ensure that there is no deviation of SWM funds for other activities to the extent possible.

### 5.3. Service models for SWM delivery

- (i) Service models for mechanised or manual street sweeping, collection and transportation, processing and disposal of solid waste shall be planned for carefully taking into account all relevant aspects.
- (ii) ULBs should identify the services that can be effectively provided with existing staff, equipment and technical knowledge. Thereafter, the ULB should prepare a list of services that need to be outsourced with a justification note mentioning the potential cost - benefits analysis and risks involved. ULBs must entrust the projects only to contractors with sufficient technical and financial capabilities and relevant experience. Private service providers have to be held accountable for maintaining required standards of services as well as its effectiveness and efficiency. The state recognises that the introduction of private players in a competitive and transparent manner in waste processing and disposal sector will provide access to latest technology, skilled manpower and economic efficiency in waste processing and disposal sector.

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- (iii) Services of the Pourakarmikas shall be utilised either through direct recruitment or only under the Direct pay system with the ULB being the principal employer. Payments shall be made directly to the bank account of each of the Pourakarmikas engaged through RTGS or similar system.
- (iv) The contracting of SWM services should be carefully considered taking into account all relevant aspects. It must be ensured that any involvement of private parties for SWM activities must be in accordance with the provisions of Karnataka Transparency in Public Procurement Act, 1999 (“**KTPP Act**”).
- (v) Create model agreements of each solid waste management service or activity such that the terms and conditions of the agreements are clear and free from ambiguity and protect the interest of the ULB / Government and ensure effective implementation of solid waste management. The terms and conditions of the agreements entered into with service providers should ensure in addition to the standard clauses for the scope of work entered into , inclusion of clauses for
  - (i) Ensuring door to door collection and transportation of a minimum of 3 segregated waste streams of wet, dry and domestic hazardous waste (including sanitary waste).
  - (ii) To ensure that the wet and sanitary waste is collected every day, and the dry waste is collected at least twice a week.
  - (iii) Commitment clause for reducing the amount of mixed waste over a stated time period across the agreement entered into , to reach a goal of 100 percent source segregation
  - (iv) “Tipping fee” means a fee or support price determined by the ULBs or any state agency authorised by the State government to be paid to the concessionaire or operator of waste processing facility or for disposal of residual solid waste at the landfill. This shall be determined in an appropriate manner that ensures no mixing, dumping or burning of waste.
  - (v) Grievance redressal mechanism against the service provider in case of non-performance, violations or any other reason.
  - (vi) Force majeure clause where the removal of waste after a natural disaster is a pre requisite in the interest of protecting public health from epidemics and pandemics. Relevant clauses for proper restoration of services by the service provider should be included in the agreement.
  - (vii) Arbitration as per the GO dated 10.01.2014 which directs that all arbitration proceedings in relation to SWM services should be referred to the Karnataka Arbitration Centre instead of the ULB in charge officer/the District Commissioner.
  - (viii) The sale of recyclables or compost should not be used as a source of funds for the ULBs. It should in fact be made available to the facility operator service provider to be set off against the operations and maintenance costs incurred and to improve the viability of the facility,
  - (ix) Contracting models should be performance based and the payment to the private partner should be based on measured outputs reflecting the service quality levels as defined in the contract. A set of key performance indicators shall be defined in the agreement for monitoring the performance of the service providers and the payment to the service provider shall be based on the service level performance achieved by the service provider. These performance indicators should include attendance of workers, usage of PPE, service coverage, waste segregation, compliance with labour regulations and EHS standards, grievance redressal and service results.

### 6. *Changes in the legal framework of Karnataka*

- 6.1. Another critical step towards implementation of provisions relating to solid waste management within the state of Karnataka is changes in the existing legal framework to incorporate the provisions of the SWM Rules 2016 and the relevant bye-laws to ensure that there is no contradiction between different legal regulations. The city corporations are governed by Karnataka Municipal Corporations Act, 1976 (“**KMCA**”) while the other categories of ULBs are governed by Karnataka Municipalities Act, 1964 (“**KMA**”). The KMCA includes specific provisions with respect to solid waste management pursuant to orders of the High

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Court of Karnataka; however, such provisions are not included in the KMA. The provisions in the KMA are only limited to sweeping and cleanliness of the area.

- (i) Therefore, as a first step, the Government of Karnataka should include specific enabling provisions with respect to solid waste management such as source segregation, provision of SWM cess/service charges, penalties etc. in the KMA. In addition, the SWM service charges and penalties should be specifically made recoverable under Chapter VII of KMA. The other existing laws and regulations applicable to ULBs that need to be amended for the implementation of the SWM Rules 2016 are set out below:
- (ii) Cap on the SWM Cess of Rs. 1000 per month under KMCA should be removed to provide for higher SWM service charges from different categories of waste generators for solid waste management services provided by the ULB.
- (iii) The schedule XIII of the KMCA containing the penalties for non-compliance of provisions relating to solid waste management should be in line with the amounts which will be included in the bye-laws.
- (iv) The relevant department of the state government and/or the ULB should also modify the building bye-laws or any other town planning regulations to accommodate mandatory onsite processing of biodegradable waste and other provisions relating to waste management.

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## ANNEXURE B: WET WASTE (BIODEGRADABLE WASTE) MANAGEMENT STRATEGY

### 1. Introduction

- 1.1 The strategy acknowledges the need for sustainable management of biodegradable waste herein after referred to as wet waste, in line with the principles of circular economy which moves away from a single stream collection of mixed waste to landfill.
- 1.2 The strategy recognises the importance of segregated wet waste (biodegradable waste) processing, as the only sustainable way forward and the need to put in place a **decentralised system of managing waste** at the local level in line with the Solid Waste Management Rules 2016 that emphasises on the adoption of decentralised waste management systems.
- 1.3 The strategy recognises that composting is an important component of integrated waste management, as it provides a range of economic and environmental benefits including improved soil health, creation of green jobs and preventing greenhouse emissions.
- 1.4 The strategy recognises that for effective functioning of segregated wet waste to compost or to extract energy (biogas) effectively, it is important to create a framework which not only develops the ecosystem and strengthens the supply chain collection of segregated wet waste but also addresses the convenience to users and incentivizes them along with the necessary regulatory system for the same.

### 2. Objectives

The main objective of the policy is that wet waste (biodegradable waste) is not landfilled, and **decentralised recovery** in the form of local composting/biogas is promoted, ensuring that toxic free compost is manufactured only from segregated wet waste and the same is used extensively in farming and horticulture, leading to improved soil health.

### 3. Guiding Principles

- 3.1. **To create a priority position on composting** from segregated Municipal Solid Wet Waste which recognizes that the optimal of handling waste is by committing that “**our waste is our responsibility**”. Wet waste should contain only source segregated waste streams of biodegradable waste comprising of vegetable and fruit peels, cooked food and other biodegradable items or garden and horticulture green and brown waste, from all generators.
- 3.2. **To promote home composting and community solutions:** The ULBs will endeavour to promote management of wet waste at the source of generation, either through home composting , vermi-composting, bio gas generation or at the community level.
- 3.3. **To promote decentralised wet waste processes over centralised where ever possible:** The ULBs shall opt for decentralised processing of wet waste wherever possible before selecting centralised large scale options. Decentralised composting as several benefits – including reduction in collection and transportation costs, reduction in smell/bad odour at the premises/storage points and roads and streets, elimination of uncontrolled leachate, shorter transport chain leading to better quality of city compost.
- 3.4. **To consider bio methanation process as a preferred recovery method, in large scale processing:** The technological progress and the financial feasibility of bio methanation methods has proven its superiority in large scale handling of wet waste , making it the preferred method for large scale wet waste processing .

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- 3.5. **To ensure only clean and toxic free compost is manufactured:** The ULBs will strive to ensure that compost so produced is from clean segregated wet waste only, via separate collection systems. Mixed waste composting generated from mechanically segregated mixed waste tends to contain greater amount of heavy metals which leaches in the soil, given the presence of other materials generated at the household level like e-waste, plastics, paints, inks, cosmetic and cleaning products, along with solutions used for pest control and pesticides for household gardens, small amounts of medicines and sanitary wastes. The long term accumulation of heavy metals in the soil environment is a concern because of their potential consequences to the human and animal health because of its presence in the food chain, toxicity to plants and soil microbial processes. The SWM Rules 2016 prescribes the need to ensure safe application of compost with specifications organic compost and manure.
- 3.6. **To phase out the use of chemical fertilisers in one year and use city compost** in all parks, gardens maintained by the ULB and wherever possible in other places under its jurisdiction.
- 3.7. **The State and/or ULB will permit suitable financial incentives** through waivers rebates, subsidies, to encourage and promote the production of organic compost from wet waste processing and utilise schemes that provide financial assistance for producing organic compost.
- 3.8. **To facilitate farmer linkages and encourage small social enterprises** leading to innovations: The constant innovation resulting in solutions and by products has increasingly made the circular economy models of various kinds of biodegradable waste more and more mainstream. Such circular practices should be followed keeping in mind that it leads to creation of jobs, protection of livelihoods and new sustainable materials and products.
- 3.9. **To encourage and facilitate urban agriculture** within the municipality including balcony gardening, large courtyards, vertical gardens, rooftops and street and community gardens and terrace gardens and develop appropriate guidelines for community and street gardens

### 4. *Strategies for wet waste management*

#### 4.1. **Through waste reduction**

The ULBs will endeavour to promote waste minimisation by necessary management of wet waste at source or point of generation that results in volume reduction and decreases the rate of per capita waste generated. This approach to waste reduction at the generator level could be through composting, home bio gas at the individual household level, insitu at the bulk generator level or market level and leaf shredding at the community, park and street level among others.

- (i) **Home composting and/or bio-gas:** With more and more convenient home composting becoming available in the market it, ULBs should pursue the options of waste reduction through promoting, supporting and also incentivising (if possible) home composting. Alternatively, home biogas should be promoted by the ULB as an alternative to use of LPG while ensuring wet waste management at source. Households should be made to understand that they are responsible for the waste that they generate and the option of handing over the source segregated wet waste to the ULB collection system is second to the preferred option of home composting or biogas. All households on land above 30 by 40 square feet should be advised to carry out home composting or biogas.
- (ii) **In situ processing by bulk waste generators:** All bulk generators including government institutions, military bases, airports, railway stations, residential apartments, educational institutions and commercial establishments generating 100 kgs or more of solid waste every day and/or occupying more than 5000 square meters should mandatorily set up in situ facilities for wet waste management if there is space available within

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their premises. This could be either composting or pre digesters or end to end bimethanation unit or any method as approved by KSPCB.

- (iii) **Leaf shredding:** This is an extremely effective way to reduce the volume of dry leaf litter, garden or horticulture waste such as grass cutting, prunings, fallen branches etc. Leaf shredding facilities could be installed in parks, educational and other campuses, residential layouts, resorts and other premises where there is space available and there is a large amount of horticulture waste that is being generated.

### 4.2. Strategies for wet waste management through Resource recovery

Wet waste is a valuable resource which needs to be redirected in the form of composting, and recovering resources from waste such as leaf mulch and compost that acts as soil nutrient, reducing toxicity of chemical fertilisers and improves food quality; energy recovery or feedstock as in the case of biogas.

- (i) **Leaf Mulch:** The voluminous amount of leaf waste that is generated in the seasonal leaf fall can be converted into leaf mulch through a process of layering and adding water. The time taken for this process can be shortened by shredding, adding inoculums and natural nitrogenous material, thereby also improving the quality of the mulch. This can be used as a soil additive and helps to retain soil quality and improves water retention. The conversion of leaf to leaf mulch is the most sustainable option instead of leaf burning or sending it mixed with street sweeping inerts to the landfill.
- (ii) **Compost:** Creating compost out of wet waste especially vegetables, fruits, leftover food is the most natural way of resource recovery. Compost processes can be aerobic, anaerobic or vermi compost and can be carried out through various methods such as in vessel, windrow, tank or other methods. Compost can be used in landscaping or by farmers in agriculture.
- (iii) **Bio methanation with pre digester method:** Large bio methanation units can be effectively supported through the use of decentralised methods of installing pre-digesters. Pre-digester is effectively an ultra-compact liquid anaerobic composting unit that is economically viable and space efficient.
- (iv) **Energy recovery:** Energy recovery in form of heat, gas or electricity using different types of bio methanation technologies is an efficient way to scale treatment of biodegradable waste. There are continuously improving technologies and ULBs should choose technologies that are best suited for their needs. Energy recovery using briquettes made from different varieties of bio degradable waste is also a suitable form of recovery.

### 4.3. Strategies for wet waste management through circular economy

For a transition to circular economy it is important for the ULBs to ensure wet waste management after waste reduction and resource recovery is not diverted but reutilized, thus deriving value from the output of the resources recovered. This will not only improve soil health, ensure safe food, but also promote entrepreneurship, generate jobs and ease pressure on the environment. New innovations in this space should be promoted, incubated and incentivised. These strategies include:

- (i) **Community Gardens:** Promote urban agriculture, terrace and rooftop gardens, community gardens, vegetable cultivation in unused spaces within the ULBs.
- (ii) **Farmer Connect Programs:** Promote the use of urban compost from decentralised units with rural farmers located on the outskirts of the city through farmer connect programs. The ULB should formulate customised plan on buying and selling price of compost, modalities of farmers on transportation and labour, and soil testing and a selling back of produce.

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- (iii) **Use in Horticulture:** The ULBs shall ensure that chemical fertilisers are completely phased in all parks, gardens maintained by the ULB and wherever possible in other places under its jurisdiction.
- (iv) **Bottling of CNG:** The ULBs shall promote the bottling of compressed natural gas( CNG) for transport and stationary applications while the slurry can be sent to farmers for the use in their fields.
- (v) **Floral waste recycling to various products:** Promoting and encouraging floral waste recycling into various products like dyes for food, textile and candle industries, organic colours for Holi, cooking essence, fragrances including agarbhattis among others.
- (vi) **Animal feed:** ULBs may also consider using biodegradable waste as animal feed especially from the markets. Selected items can be stored and collected separately to be directly taken to cow sheds, farms etc. or owners can come and collect this waste from dedicated points in the markets and other identified places.

#### 4.4. Strategies for promoting wet waste management through financial instruments, compost take back and other mechanisms

- (i) The home composting, home biogas and in situ composting should be incentivised by the ULBs through different instruments such as reduced SWM service charges /cess, development in the local area etc.
- (ii) Exemption of certain taxes including GST on biogas and similar products and services could incentivise holistic wet waste management and therefore, it can be examined by the state government at the appropriate time.
- (iii) In order to reduce the stress on the ULB infrastructure relating to collection and processing of solid waste and as a means to involve the informal sector and private sector, ULBs should consider requiring the bulk waste generator to process their biodegradable waste onsite and/or engage with an authorised private agency (similar to an empanelled vendor within BBMP jurisdiction) to collect and process their wastes. upon paying SWM service charge In many ULBs, especially smaller ones, there are currently no authorised private agencies that can process the waste generated by bulk waste generators in accordance with the provisions of SWM Rules 2016 and other applicable regulations. Therefore, it is necessary for the state to provide some time for development of responsible agencies and processing destinations that will be able to provide such services to bulk waste generators. In this context, it is recommended that the ULBs for a period of two years from the effective date of the Karnataka State Urban SWM Strategy, continue to implement door to door collection and processing for all and/or certain categories of segregated solid waste from bulk waste generators to the extent they are not processing their own waste. During this time, the ULBs should establish a system of authorised agencies that will be permitted to collect, transport and process the solid waste generated by bulk waste generators. The ULB should provide such authorisation only after a due diligence has been carried out on all applicants including their financial health, track record in the waste management sector, operations and end destinations for all streams of waste. **Also district administration can think of empanelment of bulk waste management operators provided with the advantage of scale of operation.** Further, given that the aim is to reduce the stress on the ULB infrastructure, these agencies shall not be permitted to use any wet waste processing facility, resource or asset (such as manpower or vehicles) of the ULB for its operations. The ULB should prescribe significant penalties such as fines, blacklisting, cancellation of authorisation etc. for any violation of SWM Rules 2016, or ULB bye-laws on SWM by such authorised agencies.
- (iv) In order to increase the confidence of the farmers on the product quality and enabling better market acceptance, an appropriate Standard / Eco mark shall be developed by the State for all City compost,

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including those from Bulk Generators. These standards will in line with the standards set out in the SWM Rules 2016 and relevant Fertilizer Control Order (FCO) standards.

- (v) The Department of Agriculture should take field demonstration activities to the extent possible using city compost including that from Bulk Generators, to make it popular among the farmers.
- (vi) The expenditure towards market development assistance for scaling up production and consumption of city compost should be met out from relevant state budget provisions.
- (vii) The process of subsidies for renewal energy through a single window arrangement should be set up to make efforts to converge solar, bio gas and bio fuels subsidies that support wet waste management.

### 4.5. Strategies for promoting wet waste management through community engagement, public awareness, capacity building and investment in R & D

Bringing about changes in social behaviour is a necessary part of improving waste management practices. The ULBs should look at using the participation of all stakeholders to create the strategic community engagement.

- (i) **Invest in a learning center - SwachaGraha Kalika Kendra:** In order to create a practical interface and live demonstrations of various types of composting and bio gas methods and other waste management practices, every ULB should allocate space and resources (including existing parks) to set up as many waste management experience and learning centres (and in any case, a minimum of one in each zone) as is required for the knowledge of the general public. This can be set up on the lines of the SwachaGraha Kalika Kendra in Bengaluru which has shown that live demonstrations are popular and necessary tool of learning. These centres will demonstrate not just wet waste management practices but also other sustainable alternatives to single use items, menstrual hygiene practices and closing the loop by using the compost generated in the gardens for growing chemical free vegetables.
- (ii) **Organise Compost Santhes:** Every effort must be made by the ULB to showcase sustainable options that are available at decentralised level in order to keep the general public informed on best practices for waste management. For example, activities such compost santhe have been effective in promoting best practices and community engagement at the ward level for management of wet waste. Such activities should be held at regular intervals. The ULB should seek the participation and cooperation of NGOs, SWM experts and practitioners and RWAs and extend support through financial and institutional resources.
- (iii) **Investment in R & D in wet waste management:** The state government and ULBs will encourage education, research and development work on wet waste management through incubation and accelerators programs, government grants, institutional support and financial incentives from time to time.

### 5. *Requirements for wet waste management by each Generator*

In cases where wet waste cannot be processed onsite, different types of waste generators will need to take the following steps to ensure efficient collection process, maximum recovery of resources from waste and mixed waste is avoided at all costs and there is diversion of waste from the landfill.

- 5.1. **Household Generators:** Every household should keep the wet waste free from any non-biodegradable material or domestic hazardous waste and hand over the segregated wet waste in a covered bin without a plastic liner. The generators should hand over the waste as per the collection schedule to the ULBs and/or entities authorised by the ULBs.

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- 5.2. **Bulk Generators:** A very high quantum of wet waste is generated by the commercial establishments like shops, supermarkets, malls, hotels, restaurants, eateries, street vendors and markets. All such generators should ensure that a minimum of two bins for collecting wet and dry waste is placed in the front of their establishments for disposal of the wet and dry waste by the customers. A similar arrangement should be made at the back end of every commercial establishment to store the segregated wet and dry waste that is disposed off. Bulk generators should carry out in situ wet waste processing to the extent space is available in the premises. In the event such space is not available, bulk generators can engage authorised agents for collection, transportation and processing of such wastes on mutually agreed terms. In smaller ULBs such as Town Panchayats and Town Municipal Corporations where there is no system of authorised private agencies, bulk generators shall handover wet waste in a segregated manner to the ULB collection vehicle as a part of the door to door collection system on payment of applicable SWM service charges as may be notified by the ULB from time to time. A higher frequency of collection should be provided for either by the ULB or by the empanelled service provider responsible for the commercial establishments to ensure the bins are cleared and no accumulation and spill over takes place. There shall mandatory onsite processing of bio-degradable waste through composting, biomethanation and/or any other technology approved by KSPCB/CPCB or any other appropriate government authority for **new** buildings, structures, gated communities, corporate houses, institutions and/ or constructions which contain 200 or more units or propose to have an area of 5000 sqm or more. Special Economic Zone, Industrial Estate, Industrial Park to earmark at least five percent of the total area of the plot or minimum five plots or sheds for recovery and recycling facility.
- 5.3. **Public markets:** The ULBs should either through itself or authorised private party, set up composting, biomethanation or any other suitable facility for processing bio-degradable waste in fruit and vegetable markets organised/set up by market associations (excluding Agricultural Produce Market Committee) generating 100 kgs or more of solid waste per day. If adequate space is not available, the ULB can collect the solid waste upon payment of SWM service charges. The markets managed and/or set up by the Agricultural Produce Market Committee should (i) mandatorily ensure that their bio-degradable waste is processed through composting, biomethanation or any other methods approved by the KSPCB/CPCB within their respective premises.
- 5.4. **Festival and Event Waste Management:** Festival waste created on special occasions such as Ganesh Chaturthi, Dussera, Ramzan, Diwali, New Years lead to generation of a large amount of waste. In order to ensure that the celebrations and events are carried out in a sustainable manner, all generators should follow the guidelines issued by the ULBs for minimizing the amount of wet waste, adherence to Karnataka Plastic Ban and keeping the waste streams segregated. In case of festival celebrations and events where there are no specific organisers, the vendors, shops and generators shall ensure segregation of waste and the ULB shall ensure additional special frequency for collection of the waste. In cases where there are specified event organisers, such organisers shall take appropriate permissions from the ULBs, deposit a cleanliness deposit as may be determined by the ULB and ensure that the waste generated at the event is cleared up within 24 hours of the event. The organisers shall be responsible for maintenance of general cleanliness, no mixing, dumping or burning of waste.

### 6. *Setting up Wet waste Management facilities and their operations*

#### 6.1. **Over view**

In order to achieve the main objective of this strategy that wet waste is not landfilled and maximum recovery at the decentralised level is made possible, this section details the hierarchy to be adopted to manage wet waste, overall operations and destinations for wet waste processing and related action plan. It is the obligation of the ULB to set up the various facilities, which act as processing destinations for the wet waste that are either wholly or partially owned by the ULB, operated or managed by different categories of persons, community, informal waste sector or organisations/entities. (private and/or community based).

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## 6.2. Hierarchy to be adopted to manage wet waste

- (i) **At source management** refers to wet waste management taken up in the home or in situ, which includes any type of composting or bio-methanation which results in the end product at source or pre-processes like shredding and stabilising of wet waste through the use of inoculums, preparing it for the final stage of composting or bio-methanation which is done elsewhere.
- (ii) **Community level management** refers to processing and preprocessing which is taken up at the lane or street level which caters to a cluster or block of households.
- (iii) **Ward level management** refers to wet waste processing or preprocessing which is set up to cater to wet waste received from anywhere in the ward.
- (iv) **Common facility management** refers to wet waste processing of composting or bio methanation which is set up to cater to wet waste received from designated areas across the ULB.
  - Until 100% source segregation is achieved by the ULBs, ULBs shall stabilise the mixed waste biodegradable before disposing it scientifically. This can be done by unloading such wastes in windrows and sprayed with cow dung or bio-culture and turned once every week for 4 weeks. This would ensure that (a) there is no smell from the mixed waste; (b) significant reduction in volume; and (c) inorganic component can be used as RDF while the rest of the waste can be used for landfilling/ landfill covering activities (if they do not comply with relevant FCO standards for compost).
  - Rejects/inerts (wrong material that the wet waste facility cannot process), non-biodegradable scraps, post composting residues etc. will be despatched to the relevant processing unit (such as RDF unit) and if it cannot be recovered, to the landfill facility of the ULB.

## 6.3. Strategies for overall operations - Wet Waste Management Destinations

- (i) **Institutional support:** The first step for effective operations is identification of suitable land for setting up facilities with all the due diligence followed. The second is to creating technical advisory panels for evaluating solutions and securing intra department participation and support from various governmental departments such as Department of Agriculture, Department of Forests, Department of Horticulture, Karnataka State Pollution Control Board (KSPCB), National Urban Livelihood Mission (NULM), National Safai Karamcharis Finance & Development Corporation (NSKFDC), Karnataka Compost Development Corporation, Muzrai Board as it is critical to create synergistic and conducive ecosystems, for the efficient functioning of the destinations.
- (ii) **Viable operations:** It is in the interest of the ULB to ensure that the destinations are made sustainable and viable. This is possible through selection of suitable technology and design, regular inflow of segregated wet waste, good infrastructure, investment in capital expenditure, collection of SWM service charges and wherever necessary based on the management model, provide viable gap funding, timely and regular payments to operators, undertake repairs, coordination between departments and community awareness. A viable operation is automatically a savings to the ULB in the long term due to mitigation of environment damage costs and public health concerns, cost of land wastes due to landfilling among others. A well designed facility is also necessary to create an aesthetic appeal and visibility to the general public and get their cooperation and support for the facility operations.
- (iii) **Operate within capacity:** Most often it is seen that the capacity of the destination provided is either under-utilised and left idle or is burdened beyond actual capacity by forcing it to receive more wet waste for processing. Especially with wet waste management the latter is problematic and will lead to serious issues of

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smell and compromise the quality of the process. It is therefore important to ensure that the waste received is well within the capacity of the destination.

- (iv) **Human Resources:** All operators and personnel must be trained in operations and management, understanding contaminants, the process of composting/biomethnation and other technologies relating to wet waste processing, identifying materials, odour management, emergency and first aid procedures and use of personal protective equipment. Training must be carried out at frequent intervals and personal protective equipment must be provided and mandated for use at all times the staff are handling waste. The destinations must provide dignity of work and hygienic work conditions to pourakarmikas, informal waste pickers, or other sanitary workers by ensuring basic facilities such as electricity, drinking water and areas for washing and rest.
- (v) **Approvals and compliance:** All processing facilities handling more than 5MT of waste per day should get necessary clearances under environmental clearances from KSPCB and Environmental Impact Assessment (EIA) authorities. All facilities shall comply with the standards, specifications and guidelines notified by KSPCB, CPCB, ULB and/or relevant authority or prescribed by any law for the time being in force.
- (vi) **Integration of the Informal Sector:** Integrating waste-pickers at the compost or other processing plants, after due training can improve the quality of their working conditions and their earnings.
- (vii) **Community participation and outreach** to be encouraged to the maximum possible extent through information about wet waste processing, awareness programs with the support /assistance of the local community and agencies, visits to the units among others.
- (viii) **Transparency and Accountability: (a)**The processing destinations must maintain a public record
  - of wet waste quantity that is received
  - of where the waste is being despatched and end destination/process
 (b) The destinations must be evaluated against the Service Level Benchmarks i.e. how many households is it servicing, what percentage of waste is being received segregated at source, how much is recovered and how much is sent for disposal.
- (ix) **Performance and Penalty:** The processing destinations will be monitored and evaluated as per the parameters set out in the section relating to “monitoring and evaluation in this strategy”. The destinations must be open to independent verification and evaluated on its competency in operations.

## 6.4. Setting up Destinations for wet waste management

Destination Name	Location	Set up by	Service To	Operated by
<b>At Source management</b>				
Home	Households	Households	Self	Self
In Situ	Residential , Institutional, Commercial Bulk generators	Bulk Generators	Self	Inhouse/ private service providers/empanelled agencies, wastepickers and other informal waste workers, NGOs, CBOs, SHGs

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Market	Public markets, APMC yards, wholesale markets etc.	Municipality, Market Associations such as APMC	Vendors, Shop units operating in the market	Municipal appointed operators / Market Association appointed agencies. APMC by itself, wastepickers and other informal waste workers, NGOs, CBOs, SHGs
Temples and other religious places where wet waste is generated	Temples/ such other religious places	Muzrai Board, Temple Trusts and other governing bodies of the religious places	Self	Inhouse/ private service providers/empanelled agencies appointed by Muzrai board, waste pickers and other informal waste workers, NGOs, CBOs, SHGs
<b>Community Level Management</b>				
Leaf Bins	Street	Municipality / Private	Households in the street, street sweeping Leaf litter	Pourakarmikas / Households/Ward Committee
Lane Composting	Street level / Block level	Municipality / RWA	Households	Pourakarmikas/ Households / RWA/Ward Committee
<b>Ward Level management</b>				
Park Composting	Neighbourhood Parks	Municipality	Parks	Municipal appointed staff / private service providers/empanelled agencies
Micro composting centres	At single or various locations in the Ward	Municipality	Households / Commercial generators	Municipal appointed staff / private service providers/empanelled agencies, NGOs, CBOs, SHGs working on waste management
Ward Bio methanation units	At single or various locations in the Ward	Municipality	Households / Commercial generators	Municipal appointed staff / private service providers/empanelled agencies including wastepickers and other informal waste workers, NGOs, CBOs, SHGs
<b>ULB Centralised Processing Facilities</b>				
Leaf Cutter Shredders and Coconut briquetting	Ward level/ Zonal / District level	Municipality	Street Sweeping/ Bulk Generator garden waste	Municipality appointed staff / private service providers/empanelled agencies including wastepickers and other informal waste workers, NGOs, CBOs, SHGs
SWM Composting / Bio Methanation	Zonal / District level/ City level	Municipality	Municipal collection	Municipality appointed staff / private service providers/empanelled agencies including wastepickers and other informal waste workers, NGOs, CBOs,

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Plants				SHGs
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### 6.3 Action Plan with Target timelines for setting up wet waste management operations by ULB

In the interest of streamlining wet waste management activities all ULBs should

Sl No.	Action Plan / Action Item	Timeline for TMC and TP	Timeline for CMC	Timeline for CC
1.	Notification for source segregation by households, commercial establishments and all other waste generators	3 months	2 months	1 months
2.	Notification for in situ management by Bulk generators	3 months	2 months	1 months
3.	Notification for introduction of standard / Eco mark on city compost including that from Bulk Generators	1 year	1 year	1 year
4.	Promotion activities through Compost Santhe	1 year	1 year	1 year
5.	Setting up of Compost Learning Centres	1 year	1 year	1 year
6.	Notification on requirements for festival and other event waste management	3 months	2 months	1 months
7.	Setting up of community level wet management	2 years	2 years	1 years
8.	Setting up of ward Level management	-	-	1 year
9.	Setting up of ULB Centralised Facilities	1 year	1 year	1 year
10.	Notification for mandatory onsite processing of bio-degradable waste through composting, biomethanation and/or any other technology approved by KSPCB/CPCB or any other appropriate government authority for new buildings, structures, gated communities, corporate houses, institutions and/ or constructions which contain 200 or more units or propose to have an area of 5000 sqm or more.	3 months	2 months	1 months

\* State to develop templates for all notifications and circulate it among all ULBs for adoption (excluding BBMP).

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## ANNEXURE C: DRY WASTE MANAGEMENT STRATEGY

### 1. Introduction

- 1.1 The strategy acknowledges the need to adopt the principles of circular economy – which moves away from “use and throw”, linear system to a closed loop which builds on the idea of continually reusing and recycling materials and by incorporating the framework of waste hierarchy that of reduce, reuse and recycle.
- 1.2 The strategy recognises the need to enforce the Karnataka State Plastic Ban and implement extended producer responsibilities under Plastic Waste Management Rules, 2016 and other application regulations to divert plastic waste from landfills and open areas. The state of Karnataka recognises that the funds and obligations for brandowners/producers under the extended producer responsibility framework play a critical role in plastic waste management especially low value plastic waste.
- 1.3 The strategy acknowledges the contribution of the informal waste workers across the informal waste value chain from wastepickers, waste sorters, itinerant buyers, scrap dealers/traders, aggregators and re-processors in retrieving valuable material away from landfills and their value addition in the process, through secondary sorting and handling. The strategy also recognises the need to include and integrate the informal recycling sector in the formal waste management systems adopted by the ULB.

### 2. Objectives

The overall objective of the policy is to treat dry waste as a potential resource, through a rigorous application of waste hierarchy, by practicing waste minimisation, maximising recycling and resource recovery, increase and build demand for recycled products, integration of the informal waste sector and implementing extended producers responsibility for management of plastic waste.

### 3. Guiding Principles

- 4.1. **To avoid waste/prevention of waste:** The ULBs shall endeavour to prioritise waste reduction and minimisation, through ban on single use disposable materials in line with Karnataka State Plastic Ban, encourage efficient re-use of materials through repair, re-manufacture and refurbishment. Sustained efforts should be made to encourage design of sustainable products/packaging to promote easy recyclability and phase out materials which are difficult or impossible to recover/recycle.
- 4.2. **To increase and improve resource recovery:** The objective of dry waste management should be to maximise the collection of all dry waste from the source of generation thereby ensuring minimum contamination of the dry waste material and its diversion from the landfill. The objective should also be to enable maximum recovery through sorting and grading of recyclable material which can be sent for recycling processes.
- 4.3. **To manage using the principle of proximity:** The ULBs shall implement decentralised dry waste management systems for dry waste and mandate in-situ collection space for bulk generators thereby creating savings through reduced collection and transportation.
- 4.4. **To include and improve the livelihoods:** Recognising the importance of the role of waste pickers and other informal waste workers the ULBs should provide the support, as necessary, for collection, aggregation, sorting and trading, in terms of space, providing skill up gradation, access to finance and infrastructure and social welfare benefits.

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- 4.5. **To extend the precautionary principle on energy recovery** Energy recovery may be considered only when no more material resource recovery is possible. Such technologies should be used with caution mindful of its impact on the environment and public health and in line with the requirements of applicable law.
- 4.6. **Implement extended producer responsibility for plastic waste** In Karnataka, EPR obligations under PWM Rules will need to be implemented harmoniously along with the Karnataka Plastic Ban. In light of the above ban on plastic, EPR obligations will be most relevant to the manufacturers, brand owners and producers manufacturing goods which are sealed in plastic packaging prior to use at manufacturing/processing units and dairy products, which are currently exempted from the ban.

## 4. *Strategies for Dry Waste Management*

In line with the guiding principles and objectives, the following strategy will be adopted:

### 4.1. **Implementation of Karnataka State Plastic Ban:**

- (i) All ULBs shall enforce and implement the Karnataka State Plastic Ban. In addition, the State of Karnataka through Department of Ecology and Forests shall issue an additional notification for penalties for violation of the provisions of the Karnataka State Plastic Ban such as manufacturing, supplying, storing, transporting, sale or distribution of banned items of plastics.
- (ii) All ULBs will undertake regular and effective monitoring through interdepartmental coordination and joint inspection drives. In addition the ULBs should undertake awareness drives on ban of single use-plastics and promotion of alternatives for packaging and health impacts of plastics.

### 4.2. **Efficient material recovery of Dry Waste through enforcement of segregation of waste at source**

- (i) In order to ensure collection of segregated dry waste from the households it is necessary for the ULB to carry out the door to door collection from all waste generators.
- (ii) Every ULBs should ensure that all dry waste is collected separately in a suitable frequency, on specified days of the week. This separate collection should be emphasised in order to gain support from households on segregation at source.
- (iii) The ULB should specify at least one day in a month for collection of bulky waste such as mattresses, furniture and other large items (furniture but excluding construction debris items like ceramic ware like sanitary fittings, bath tubs, wash basins and commodes) which cannot be accommodated during door to door collection. Such minimal construction debris shall be handled and disposed in accordance with applicable regulations. Any waste generator can also directly deposit their bulky waste at the relevant materials recovery facility, dry waste collection centre and/or other appropriate secondary storage facility designated or notified by the ULB.
- (iv) Where such door to door collection is not possible because of the spread either in the outskirts, outlying or hilly areas, the ULB should plan to set up local collection points/kiosks where the households, small commercial establishments and other similar waste generators can come and drop off the wet and dry waste and such waste can then be collected by the closest dry waste collection centres. Such wet waste can be treated in a decentralised manner and the dry waste can then be collected by the closest dry waste collection centres.

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- (v) The ULBs shall endeavor to enable dry waste collection by the authorised entities of wastepickers such as self help groups, cooperatives, community based organizations and/or social enterprises who may also be operating the dry waste collection centres.

### 4.3. Efficient material recovery of all Dry Waste for collection, with Extended Producer Responsibility support of buy back of plastic waste (including non-recyclable fractions)

- (i) **Invest in collection/aggregation Centers:** Brand owners, producers and manufacturers should be required to be involved in plastic waste management as per the provisions of PWM Rules 2016 and applicable directions from the CPCB, KSPCB and other competent authorities.
- (ii) **Buy back of the plastic waste:** The brandowners/producers will facilitate buy-back of plastic waste especially non-recyclable fractions.
- (iii) **EPR compliance and funds:** KSPCB shall ensure compliance of EPR obligations under PWM Rules by producers and brand owners

### 4.4. Use of Energy recovery methods for disposal of non recyclable dry waste

- (i) The integrated waste management hierarchy indicates that recovery of energy from waste is preferable only after considering the potential for recovery of material. Co processing of non-recyclable waste by cement companies is one of the most preferred options, given the strict regulatory emission norms that are required to be complied with and as there are enough cement companies that already exist. Therefore, in several ULBs there is no requirement to set up special infrastructure. In accordance with the of Guidelines on Usage of Refuse Derived Fuel in Various Industries issued by Ministry of Housing and Urban Affairs, the state of Karnataka will promote co-processing of suitable non-recyclable non-biodegradable waste/RDF/SCF in cement factories which are within 100 kms or such distance prescribed by competent authority at the relevant point of time. Towards implementation of these guidelines, the Deputy Commissioner of each district will take steps towards identifying appropriate cement plants, negotiating the acceptable standards for SCF/RDF and related pricing and executing long term contract with the identified cement plants to lift the SCF/RDF with negotiated terms including the price of the RDF/SCF and transportation costs.
- (ii) Energy recovery through use of boilers in thermal plants may also be considered where proximity of cement companies is not available.
- (iii) The setting up of a waste to energy unit using various technologies of either incineration, gasification for generation of power shall be explored in adherence to prescribed standards by CPCB, KSPCB and any other applicable authority.
- (iv) Use of segregated combustible fraction in any other boiler or furnace type other than cement units or thermal power units should be subject to strict regulatory norms on emissions as is defined from time to time. In the event co-processing in cement kilns is not a viable option for ULBs, the ULBs could consider waste to energy options such as thermal processing technologies which have been approved by KSPCB/CPCB as per the guidance set out the Karnataka State Urban SWM Policy and this strategy. Before finalising and adopting any thermal or other new waste processing technology, the relevant governmental agency such as the DMA, KSPCB and/or UDD shall ensure that feasibility studies and/or pilot projects are carried out to consider factors such as waste quantities and characteristics, environmental concerns, financial, technology and manpower requirements among others.

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- (v) It is important to emphasise that only the non-recyclable, non bio-degradable combustible fraction of the dry waste should be considered for energy recovery. The use of recyclable dry fraction for energy recovery shall be avoided as this goes against the principles of circular economy for which this strategy stands

### **4.5. Use of no value – non recyclable dry waste in alternative product uses**

- (i) One of the ways that ULBs can consider using plastic waste especially non-recyclable plastic is to use them in making bituminous roads as per the Indian Roads Congress Guidelines IRC:SP:98=2013 Guidelines for the use of Waste Plastic in hot bituminous Mixes ( Dry Process). According to Indian Road Congress (IRC), addition of waste plastics in bituminous construction in small doses (about 5-10%), helps in substantially improving the Marshall stability, strength, fatigue life and other desirable properties of bituminous mix, leading to improved longevity and pavement performance.
- (ii) ULBs shall compare the options of processing of plastic waste in road construction and waste to energy options like co-processing in cement plants, thermal processing for non-recyclable plastic bearing in mind factors such as proximity to cement factory, infrastructure costs, manpower, technology, availability of infrastructure for shredding/baling, economic viability among others. Depending on the aforesaid factors and availability of sufficient quality and quantity of plastic waste, the state of Karnataka recommends the usage of plastic waste in following minimum percentage of total asphalt roads within ULB limits: (a) 10% of the total length of roads in CMC; and (b) in CC, 15% of the total length of roads as per the standard schedule of rates issued by the Public Works Department.
- (iii) While currently the IRC guidelines specify low-density polyethylene (LDPE), high-density polyethylene (HDPE), polyurethane (PU) and polyethylene terephthalate (PET) as the only type of plastics that can be included in the bituminous mix, KSPCB along with IRC, other relevant governmental authorities, educational institutions and R&D organisations should carry out research on the viability of use of multilayered packing and other types of non-recyclable plastic as the input for road construction. If found technically viable and environmentally friendly, use of such plastic types should be encouraged and standards should be revised to include these plastic waste categories in bituminous mix as well.
- (iv) The ULBs may also encourage the creation of plastic bricks or any new innovation which may be used to lay roads, create embankments or in home construction in accordance to prescribed standards.

### **4.6. Promote demand for recycled material and encourage limited packaging**

- (i) The state government will endeavour to promote the demand for recycled materials and products containing recycled content by setting down time bound targets for increasing the component of recycled content in packaging.
- (ii) Eco-labelling of product packaging promoting conscious consumption and leading to waste reduction should also be actively promoted.

### **4.7. Creation of Alternative technologies**

- (i) The KSPCB, Department of Science and Technology and the Department of Commerce and Industries shall set up technical advisory and mentoring boards which incubate alternative technologies , evaluate them and put out advisory and information manuals for use by the local bodies especially in the area of energy recovery , plastic to fuel , plastic to roads, plastic to bricks among others. The technologies promoted should at no point in time undermine the material recovery of recyclable material and create adverse impact on the environment.

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- (ii) KSPCB along with other relevant governmental departments under the provision 4 (b) of the KTPP Act may recommend to ULBS for setting pilot plants within their jurisdictions where experimental technologies such as pyrolysis or gasification can be tested and monitored for a longer span of time to assess their impact on the health and environment, cost efficiency and conformity with the existing standards. While evaluating these technologies, the energy equation must be assessed carefully, i.e. the energy used in processing and pre-processing activities (such as washing, shredding, de-moisturising etc.) per ton of feed and the output per ton of feed.

### 4.8. Knowledge Sharing, Public Information and Education to promote waste minimisation, reuse and recycling

- (i) The ULB should create ongoing, large scale awareness campaigns and educational programmes which highlight the harmful effects of certain materials and promote reuse and recycling. The ULBs should also promote alternative to plastics in order to bring about a real shift in the use of single use plastics
- (ii) The campaigns should also create sensitivity towards the waste pickers who carry out the manual handling and sorting of dry waste that is collected from households. This should be done seeking the participation of citizen groups, civil society organisations, non-government organisations and waste picker organisations.
- (iii) All points of citizen interface like the dry waste collection centres or the collection points should have well displayed uniform signage and attractive uniform structures which will drive better cooperation and participation from the general public.

### 5. Requirement for Dry Waste Management by each Generator

In order to achieve maximum segregation at source and efficient collection process of dry waste from every generator, so that the wet waste can be processed suitably, dry waste can be sent for recycling and the non-recyclable fractions can be sent for energy recovery, and mixed waste is avoided at all costs, the following requirements must be adhered to:

- 5.1. **Household generators:** Every household should store the segregated dry waste, free of organic contaminants, in a reusable bag or bin and hand over the same at the frequency determined by the ULB. The generators should also provide access to hand over such segregated dry waste as per the collection schedule to the ULBs and/or entities authorised by the ULBs including authorised entities of wastepickers.
- 5.2. **Bulk Generators:** A very high quantum of wet waste is generated by the commercial establishments like shops, supermarkets, malls, hotels, restaurants, eateries, street vendors and markets. All such generators should ensure that a minimum of two bins for collecting wet and dry waste is placed in the front of their establishments for disposal of the wet and dry waste by the customers. A similar arrangement should be made at the back end of every commercial establishment to store the segregated wet and dry waste that is disposed off. Bulk generators should engage authorised agents for collection, transportation and processing of dry wastes on mutually agreed terms. In smaller ULBs such as Town Panchayats and Town Municipal Corporations where there is no system of authorised private agencies, bulk generators shall handover dry waste in a segregated manner to the ULB collection vehicle as a part of the door to door collection system on payment of applicable SWM service charges as may be notified by the ULB from time to time. A higher frequency of collection should be provided for either by the ULB or by the empanelled service provider responsible for the commercial establishments to ensure the bins are cleared and no accumulation and spill over takes place.
- 5.3. **Festival and Event Dry Waste Management:** The responsibilities shall be the same as set out in above under the same heading in point 5.4 of Annexure B.

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## 6. *Setting up and operationalising Dry waste management facilities*

### 6.1. **Overview**

In order to achieve the main objective of this policy, that dry waste is not landfilled and maximum resources are recovered from it, this section details the hierarchy to be adopted to manage dry waste, planning for material inflow and outflow, strategy for overall operations, destinations – both formal and informal and the action plan. It is the obligation of the ULB to set up the various facilities and provide supportive environment including infrastructure and access to end destinations for dry waste management.

### 6.2. **Strategies for Overall Operations- Dry waste Management Destinations**

In addition to the strategies set out in Annexure B, the ULBs shall carry out the following:

- (i) **Institutional support:** The first step for effective operations within the formal system is identification of suitable land for setting up facilities with all due diligence followed. Within the informal waste system recognising places of operations and creating supportive environment for effective functioning is required for integration and formalisation of the informal sector. The second step is to create an enabling environment like securing intra department participation and support from different governmental departments such as Karnataka State Pollution Control Board (KSPCB), National Urban Livelihood Mission (NULM), National Rural Livelihood Mission (NRLM), National Safai Karamacharis Finance & Development Corporation (NSKFDC), along with the Commercial Tax Department, Excise Department, Industry Associations, other NGOs etc as it is critical to creating synergistic and conducive ecosystems for the efficient functioning of the destinations.
- (ii) **Minimum number of DWCC/MRFs:** Segregation, sorting and recovery of recyclables from various components of waste could be carried out at materials recovery facilities (MRF), dry waste collection centres, transfer stations or at the waste processing plants. Depending on the category of ULBs, the following minimum number of DWCCs and/or MRFs shall be provided:
  - (a) One for each town panchayat;
  - (b) Two for each town municipal council,
  - (c) At least three for each city municipal council having a population of 1,50,000 persons and thereafter, there shall be one DWCC/MRF for every 50,000 persons and For each city corporation, there shall be one DWCC/MRF for every 50,000 persons.

The capacity of DWCC ranges from 1 tonnes to 5 MT per day while the typical capacity of a MRF shall be above 5 MT per day.

The DWCC/MRF should also have adequate space and facilities for **(a)** accepting non-biodegradable waste from collection vehicles, waste-collectors and/or other authorised agents; **(b)** sorting, baling and temporary storage of non-biodegradable waste **(c)** appropriate and separate receptacles for temporary storage of different categories of non-biodegradable waste including combustible waste, multi-layered packaging, inert waste and non-recyclable waste, non-reusable waste. The size of the DWCC should be at least 1500 sqft of space for 1 TPD of non-biodegradable, non-hazardous waste. In larger MRF where waste flow is more than 5 TPD, conveyor belts should be installed to improve sorting efficiencies and hygiene standards.

- (iii) **Destinations for low value dry waste:** While several categories of non-biodegradable waste such as PET bottles, papers, glass bottles, electric wires are sold existing chain of scrap dealers, large percentage of recyclables non-biodegradable waste of low value such as paper cups, tissues, colour paper, multi-layer cartons, coloured glass, thermocol, low micron plastic bags etc. are often not handled by local scrap dealers. For such materials, the ULB will need to ensure that the primary collectors do not dump or burn these low value recyclables and there are there are adequate mechanisms to process these items as well.

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- (iv) **Compliance requirements:** Processing including recycling units for different categories of dry waste that can be recycled should be set up by private players and/or ULBs. They should comply with the requirements set out in the SWM Rules 2016, Plastic Waste Management Rules 2016, Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981. Further, the recycling of plastic waste should conform to the Indian Standard: IS 14534:1998 titled as Guidelines for Recycling of Plastics.
- (v) **Regional facilities:** Resource, technology, and capital-intensive waste management processing facilities such as recycling plants, RDF units, waste to energy plants and sanitary landfills are best planned as centralised regional/shared systems, which can benefit from economies of scale. ULBs are encouraged to form clusters with the help of Urban Development Department based on the land availability, distance of proposed site from ULBs, quantum of waste generated, road network, site suitability, financial feasibility and sustainability and social acceptance. This will help in reducing the financial and technical burden on individual ULBs and result in more efficient use of land and other resources such as infrastructure costs, manpower, fuel and distribution of operation and maintenance costs between ULBs. These facilities can also be monitored closely for operations, efficiency, environmental impact and other performance related parameters.
- (vi) **Waste to energy units:** In the above context, stand-alone waste to energy units should be set up in ULB which are able to supply at least 500 MT of waste per day. For smaller ULBs with lesser waste generation, it is recommended that cluster-based approach is followed where a group of ULBs facilitated by state government, may set up a waste to energy unit that collectively supplies at least 500 MT of waste per day, to the plant. In a cluster-based approach, one ULB takes the initiative for setting up the plant in consortium with other ULBs by pooling up their financial resources. Alternatively, ULBs in partnership with a private party can also set up the waste to energy units under PPP model. Revenue for operation and maintenance may be generated through tipping fee for processing of segregated combustion fuel, sale of electricity etc.. Alternatively, the ULB can also consider adopting an output model i.e. buying energy/electricity/ fuel at a higher rate rather than providing a tipping fee or upfront capital expenditure for waste to energy facilities. This would ensure that government funds don't get locked if the units do not function.
- (vii) **Involvement of the informal sector:** It is important for the ULB to arrive at a convergence with the informal sector and recognise and create supportive infrastructure at all levels, integrating with the formal systems, in a complimentary mode.
- (viii) **Extended Producer Responsibility (EPR)** participation can be encouraged or enforced for support in setting up the capital intensive technologies and process to help process plastic waste especially non recyclables, multi-layer laminates. This would greatly assist the financial viability of dry waste management by the ULB.

### 6.3. Destinations for Dry Waste Management

Destination Name	Location	Set up by	Service To	Operated by
<b>Secondary Collection, Sorting &amp; Storage</b>				
Dry Waste Collection Centres ( DWCC)/Sorting sheds	Ward Level/Cluster level	ULB/ private service providers/empanelled agencies	Households, Small shops	ULB/ private service providers/empanelled agencies including scrap dealers and other informal waste workers, NGOs, CBOs, SHGs

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Material Recovery Facility (MRF)	Anywhere	Municipality / private service providers/empanelled agencies	Households, commercial establishments, Bulk Generators	ULB/ private service providers/empanelled agencies including scrap dealers and other informal waste workers, NGOs, CBOs, SHGs
<b>Processing Centres</b>				
Recycling Units	Within Industrial and other feasible areas	ULB/ private companies/service providers	DWCCs, Informal Sector and empanelled agencies	ULB/Private Service Provider
SCF/RDF Units	Within Industrial and other feasible areas	ULB / Private Service Providers/ Private Companies	DWCCs, Informal Sector and empanelled agencies, Wet Processing Plants	ULB/Private Service Provider
<b>Disposal Units</b>				
Bitumen Mix plants	Anywhere	ULB / Private Service Providers/ Private Companies	ULB	Road Construction Agencies
Co processing Cement Plants	Anywhere within 400 Kms of the City Limits	Private Companies	RDF Units/MRFs/DWCCs	Private Companies
Waste to energy facilities	Anywhere within 400 kms of the City Limits	Thermal Power Companies and private companies	RDF Units/MRFs/DWCCs	Private Companies

### 6.4. Action Plan with Target timelines for setting up dry waste management operations by ULB

The ULBs, Directorate of Municipal Administration, KSPCB, Town Planning Department and other relevant governmental agencies should co-operate and create the necessary infrastructure to implement the provisions of SWM Rules and the principles set out in this Karnataka State SWM Strategy as per the following timeframe:

Sl No.	Action Plan / Action Item	Timeline for TMC and TP	Timeline for CMC	Timeline for CC
1.	Enforcing Karnataka State Plastic Ban	6 months	6 months	6 months
2.	Identification and procurement of suitable sites for setting up DWCCs or materials recovery facilities	6 months	6 months	6 months
3.	Setting up of DWCCs and materials recovery facilities	1 year	1 year	1 year
4.	Setting up plastic recycling facilities and facilities for recycling of other categories of non-biodegradable waste, as necessary.	3 years	3 years	2 years
5.	Setting up RDF facilities and other approved waste to	-	-	2 years

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	energy facilities			
6.	Linkages with cement factories for co-processing of non-recyclable waste	6 months	6 months	6 months

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## ANNEXURE D: DOMESTIC HAZARDOUS WASTE, SANITARY WASTE MANAGEMENT AND SPECIAL WASTES STRATEGY

### 1. *Introduction*

- 1.1. The strategy recognises that disposing sanitary waste, domestic hazardous waste and special streams of wastes such as slaughterhouse waste from meat shops and other generators is a significant problem and needs to be tackled in a safe and efficient manner, in line with the Environment Protection Act, 1986, the Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981 and other applicable regulations.
- 1.2. The Karnataka State policy recognises the importance of separate collection of sanitary waste, in line with the Karnataka High Court Directions WP 24739/2012, which directs ULBs to adopt the 2Bin1Bag method for segregation of waste.
- 1.3. The strategy recognises the need to safeguard the working conditions of pourakarmikas, wastepickers and other sanitary workers and the system of collecting sanitary waste, domestic hazardous waste and slaughterhouse waste must not result in any occupational hazard for such staff.
- 1.4. The strategy recognises the importance of centralised processing of sanitary waste, domestic hazardous waste and slaughterhouse waste due to the hazardous nature of the waste and the specialised technologies that are required for safe disposal of the wastes.
- 1.5. The strategy recognises that there is need to promote sustainable menstruation and sustainable diapering in the state to reduce the burden of sanitary waste on the municipal waste system.

### 2. *Guiding Principles*

- 2.1. **To carry out collection and processing of only domestic sanitary waste:** The ULBs will ensure separate collection of domestic sanitary waste only, on a day-to-day basis which includes used diapers, sanitary pads/towels, napkins, tampons, condoms and incontinence sheets, which are wrapped in newspapers or non-chlorinated bags provided by brand owners. Such waste will be channelised to domestic hazardous waste centers and from there to centralised biomedical facilities within the ULB or using a cluster mode to the common bio-medical waste treatment facility.
- 2.2. **To ensure there is no contact in handling during collection:** The ULBs will make appropriate announcements on the need to wrap domestic sanitary waste in newspapers and will ensure that municipal or any other workers handling the waste are provided with appropriate personal protective equipment.
- 2.3. **To carry out centralized processing:** In line with the emission standards, prescribed by the SWM Rules 2016 and Bio-medical Waste Management Rules 2016, the ULBs will opt for centralised facilities or through a cluster based approach to a common biomedical facility for disposal of sanitary waste. In addition, ULBs will evaluate a combination of alternative processes of deep burial and auto claving along with centralised incinerations. The domestic hazardous waste (excluding sanitary waste) shall be processed through TSDF (Treatment Storage Disposal Facility), incineration and/or any other suitable method determined by KSPCB. If it is not processed through these methods, it shall be transported to sanitary landfills for scientific disposal.
- 2.4. **Management of slaughterhouse/meat waste:** The ULBs shall manage slaughter house waste from meat shops and other generators in compliance with applicable regulations such as guidelines issued by the Karnataka State Pollution Control Board (KSPCB), Water (Prevention and Control of Pollution) Act, 1974, Prevention of Cruelty to Animals (Slaughter house) Rules 2001 and similar guidelines on this subject.

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## 3. *Strategies for Management of Sanitary Waste, Domestic Hazardous Waste and special waste streams*

### 3.1. Public Education, Information and Communication and Capacity Building

- (i) To promote awareness on the harmful effects of irresponsible disposal of domestic hazardous waste (including sanitary waste) such as throwing them in vacant sites, open spaces and drains and the strategy adopted by the ULB for separate collection, including the right way of wrapping sanitary waste.
- (ii) To promote menstrual hygiene management cross all stakeholders, in particular the applicable disposal strategies and the need to switch to sustainable alternatives. To promote sustainable menstruation like reusable cloth pads, menstrual cups and sustainable diapering as ULB level.
- (iii) Every occupier of any premises who generates poultry, fish and slaughter waste as a result of any commercial activity, should be made aware of the safe practices for management of slaughterhouse waste.

### 3.2. Separate Collection and Domestic Hazardous Waste Collection Centers

- (i) The ULBs shall incorporate in the bylaw the process of separate collection of domestic hazardous waste, slaughterhouse waste and sanitary waste, wrapped in newspaper or non-chlorinated bags provided by brand owners for collection. The ULBs should collect sanitary waste daily and other domestic hazardous waste (except sanitary waste) on a monthly basis.
- (ii) The ULBs shall make arrangements with local hospitals for aggregation and channelization of sanitary waste to biomedical facilities on a periodic basis.
- (iii) The ULBs will keep a record of sanitary waste and domestic hazardous waste collected at the ward level.
- (iv) As a first step, ULBs must register all meat and slaughterhouse vendors so that it can assess the number of collection vehicles required and frequency of collection. The generators of slaughterhouse waste shall store such waste separately in a closed and hygienic condition and such waste shall not be mixed with any other category of solid waste. The ULB should collect slaughterhouse waste every day and the relevant occupier shall ensure that such waste is ready for collection on the designated times. The ULB should ensure that slaughterhouse waste is not mixed with any other stream of waste during collection and transportation and is transported directly to the relevant processing centres.

### 3.3. Processing and Infrastructure

- (i) Sanitary waste shall be processed at the nearest common biomedical waste treatment facility in the ULB along with other bio-medical waste generated in larger ULBs. In the absence of biomedical processing facility, the ULBs will ensure that the collected sanitary waste is transported to common shared facility operated in a cluster mode between ULBs.
- (ii) At small towns, if sanitary pads and diapers are made of natural fibres not bleached and without plastic covering, deep burial method can followed as per applicable guidelines. Alternatively, sanitary waste can be disposed off in any other manner which is approved by CPCB and/or KSPCB.
- (iii) The ULBs, such ULBs shall earmark a portion at DWCCs/MRFs for depositing domestic hazardous waste with adequate safeguards.

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- (iv) Waste generated from slaughterhouses, poultry and fish markets and animal carcass, shall be processed/disposed using appropriate processing technique such as rendering, bimethanation, controlled incineration or burial as stipulated scientific standards should be used by the ULBs. The ULBs can also explore such waste being inputs for pet food industry or any other processing industry as per applicable law and standards.

### 3.4. Extended Producers Responsibility

- (i) The state of Karnataka will also consider involving manufacturers and/or brand owners of sanitary products such as diapers, sanitary napkins, tampons etc in the processing and disposal of sanitary waste generated by their products.

### 3.5. Convergence with Karnataka State Pollution Control Board

- (i) Karnataka State Pollution Control Board shall review and assess the technologies used in mini and modular incinerators for disposal of sanitary napkins in accordance with the emission and other environmental standards prescribed under applicable law.
- (ii) KSPCB can facilitate identification of producers of sanitary products who can associate and assist the ULB to make necessary arrangement for collection and disposal of sanitary waste

### 3.6. Action Plan with Target timelines for setting up sanitary waste management operations by ULB

Sl.no	Action Plan/Action Item	Target	Timeline
1.	Notification on separate collection of sanitary waste and procedure for wrapping and collection and collection of domestic hazardous waste	100%	Within 3 months
2.	Notification on separate collection of slaughterhouse waste	100%	Within 3 months
3.	Establish waste deposition centres or earmark a portion at DWCC for depositing domestic hazardous waste and give direction for waste generators to deposit domestic hazardous wastes at this centre for its safe disposal as prescribed by KSPCB /any competent authority.	100%	1 year
4.	Establish linkages with common biomedical treatment facilities for disposal of sanitary waste	100%	Within 6 months
5.	Establish destinations for processing of slaughterhouse waste from meat shops and other generators	100	3 years

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## ANNEXURE E: MONITORING AND EVALUATION OF SOLID WASTE MANAGEMENT SYSTEM

1. **Key aspects to be monitored:** Specifically, the key aspects of solid waste management that need to be monitored by the ULB and why they need to be monitored are:

### Overview of monitoring of key aspects of solid waste management system

S.no	Head	Description
1.	<b>Waste generation</b>	<ul style="list-style-type: none"> <li>Quantity, categories of waste generators and types of waste being generated (biodegradable, dry, domestic hazardous and other special categories)</li> <li>Waste reduction</li> <li>Where and how is it stored (primary storage)?</li> <li>Level of segregation</li> <li>Level of dumping/ black spot</li> </ul> <p>This would help the ULB monitor the segregation levels, waste characteristics and amount of waste generated as per different areas within the ULB jurisdiction.</p>
2.	<b>Waste collection and transportation</b>	<ul style="list-style-type: none"> <li>How much waste of different categories is collected (primary and secondary collection)?</li> <li>How is it collected (manpower and equipment/ allocated and actual utilisation)?</li> <li>When is it collected (adherence to planned schedules)?</li> <li>Where is it stored and transported (primary and secondary storage and transportation)?</li> <li>Levels of segregation during transportation.</li> <li>Cost of collection and transportation at each stage</li> </ul> <p>This would assist ULB in estimating collection efficiency, adequacy of collection infrastructure and costs incurred by the ULB (including capital costs and operational costs).</p>
3.	<b>Waste processing</b>	<ul style="list-style-type: none"> <li>What type and how much of each category of waste is processed?</li> <li>Where and how is the waste processed and what is it processed into?</li> <li>Adherence to standard operating procedures and compliance requirements including all environmental norms / contractual terms and tender norms</li> <li>Cost of operations, maintenance and upgradation at each processing facility including sanitary landfill sites.</li> </ul>
4.	<b>Sweeping, Drain Cleaning</b>	<ul style="list-style-type: none"> <li>Which areas are being swept, how often and with what?</li> <li>Manpower and material allocated and used in sweeping and drain cleaning.</li> <li>Collection and transportation of waste from sweeping and cleaning.</li> <li>End destination for the street sweepings and drain cleaning</li> <li>Cost of operations and maintenance.</li> </ul> <p>This would ensure adherence to planned activities, norms and budget with respect to street sweeping and drain cleaning.</p>
5.	<b>Complaint redressal and penalties</b>	<ul style="list-style-type: none"> <li>Recording, tracking and analysis of all complaints received via different mediums</li> </ul>

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		<ul style="list-style-type: none"> <li>• Assignment of complaints to different ULB officials and redressal efficiency including timelines.</li> <li>• Collection of penalties/fines for non-compliance relating to segregation, dumping, burning; black spots or issues with processing sites.</li> </ul> <p>This would assist the ULB in tracking efficiency of redressing complaints and rectifying issues that have been identified with respect to different components of the waste management systems.</p>
6.	<b>Recovery of costs and sustainability of SWM activities</b>	<ul style="list-style-type: none"> <li>• Collection and recovery of SWM service charges from different categories of waste generators.</li> <li>• Extent of capital and operational costs that is recovered by SWM service charges, funds from governments, sale of compost/energy/recycled products etc.</li> <li>• Adherence to budgets, preparation of accounts and completion of audit.</li> </ul>

2. **Technology for data capturing and analysis:** The key technologies that are currently being deployed for solid waste management are:
  - 2.1. **Biometric system for attendance tracking:** Tracking of attendance is one of the most crucial aspects of monitoring of staff and it is cumbersome and prone to tampering when done manually. This is especially the case for pourakarmikas and other staff deployed for door to door collection, street sweeping and transport of waste. Therefore, ULBs must install biometric attendance for both ULB staff and personnel deployed by contractors to ensure accurate and efficient attendance process. In addition, an MIS system which is linked to the biometric attendance system can track leave and performance and enable direct payments to the bank accounts of pourakarmikas (as applicable). This would also reduce corruption, requirement of middle men and tampering with attendance records.
  - 2.2. **GPS and geo-fencing for tracking vehicle movement:** The ULB should ensure that all vehicles are GPS enabled and to the extent possible, all wards/zones should be geo fenced. If this is done, it can be easily detected if any vehicle deviates from its planned route and schedule. Collection reports could be prepared manually or could be generated automatically through a MIS system.
  - 2.3. **Smart CCTV Cameras:** Smart CCTV cameras can be used for tracking and monitoring black spots, open dumpsites and other areas where frequent dumping occurs. The cameras can exactly pinpoint the instances of dumping thereby reducing the time required to review the camera feeds.
  - 2.4. **Bar Code/ NFC (Near Field Communication) / RFID (Radio Frequency Identification):** These can be used for tracking and handling of public or community bins. Every time a bin is emptied, the tag would be scanned and the date and time of collection will get automatically recorded. The quantity of waste can also be recorded if there is a weighing system in the vehicle. Trash level sensors could be installed for tracking overfilled public bins.
  - 2.5. **Smart phones, tablets and applications:** Smart phones/tablets along with customised apps, can be used for the following by the ULB:
    - (i) Data entry on various aspects of collection, transporting and processing of solid waste from the field. These applications with user friendly (pictorial) interface can also be used by for non-technical/uneducated staff.

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- (ii) Engagement with citizens such as collection schedules (including any deviations), lodging and tracking of complaints, reporting of black spots, dumping and burning with tagging of time and location along with photographs.
  - (iii) Customer feedback and rating for assessing the performance (hence payments) of the staff and contractors.
3. **Roles and Responsibility:** Key Roles and Responsibilities to be defined in SWM system are defined below:
- 3.1. **Responsibility for regular data collection and data authenticity.** Data could be collected manually or the process could be automated but the responsibility has to be assigned to various ULB departments and officials for ensuring regular data collection, authenticity and accuracy. In the absence of a specific SWM cell/department, Health Inspectors and/or Environmental Engineers could be given responsibility to collect data related to waste generation and collection at ward or zone level. The responsibility for data related to waste processing could be assigned to the respective facility operators.
- 3.2. **Responsibility for report preparation, analysis and follow up action:** Reports could be prepared manually or could be generated automatically from MIS system. Senior officers of the ULB should be made responsible for analysing the ward level reports and they should question and evaluate the concerned officers and work out action plans. They must be held responsible for some key high level metrics in the identified areas of the ULBs for Service Level Benchmarks such as segregation levels, percentage of collection, number of black spot; attendance and vehicle utilisation and amount of waste disposed in landfills. A clear hierarchy needs to be defined which identifies responsibilities and timelines for different components of solid waste management systems. The hierarchy should also state if the appropriate and timely action is not taken, such issues must automatically get escalated through a formal mechanism.
- 3.3. **Responsibility for key verticals:** While a large amount of data would be collected and acted upon at ward/zone level. It would be a good practice to assign responsibility for certain functions centrally such as:
- (i) Complaints and redressal tracking
  - (ii) Human resource data for pourakarmikas and other staff to ensure there are no ghost employees and efficiencies of existing staff.
  - (iii) Tracking SWM fees and fine collection from waste generators
  - (iv) Tracking salary payment and bill clearance for contractors and contracted staff
  - (v) Tracking overall vehicle utilisation, fuel consumption and maintenance etc.
  - (vi) Performance monitoring of contractors and other operators and identifying best and worst performers
  - (vii) Compliance for all environmental and legal rules and norms
  - (viii) Processing of different categories of waste
  - (ix) Tracking and analysis of operational risks
  - (x) Identifying best practices and key challenges by comparing data across ULBs in the state and regularly interacting with other states for bench marking exercise
- 3.4. **Surprise checks and monitoring responsibilities:** The ULB should conduct regular checks in various parts of the wards and other places of collection, transportation, processing and disposal of solid waste within its territorial limits to supervise compliance of various provisions of SWM Rules 2016. In addition, authorised officers should monitor and review the implementation of the ward micro plan and prepare ward action taken report on a monthly basis for onward submission to the Commissioner or Chief Officer of the ULB. The ULB should also review the facilities and operations of the contractors, private players (including waste picker and worker organisations) and vendors to ensure that they are in compliance with all applicable environmental, labour and other norms applicable to solid waste management.

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3.5. **Responsibility of Ward Committees:** Ward level committees (where constituted) should also be involved in ensuring and monitoring SWM service provision including segregation, collection, transportation, street sweeping, drain cleaning, and prohibition of littering. The ward committees will assist in preparation of action plans by the ULB. In this regard, the ward committee shall assist in assessment of the type and quantity of solid waste generated in the ward, existing processing capacity, plans for additional processing and facilities. Once requirements and targets have been identified in the action plan, these will be monitored regularly by the ward committee through regular meetings and escalations to ULB, if necessary. The councillor/corporator who is the head of the ward committee must be held responsible for the duties and obligations of the committee.

3.6. **Role to be played by resident welfare associations, Suchi Mithras and other community groups:** Concerned citizens may also form resident welfare associations, Suchi Mithra and/or self-help groups in each ward, for the following activities:

- (i) Raising awareness about source segregation including door to door campaigns and assisting the ULB in achieving the maximum levels of segregation.
- (ii) Encourage home and/or community composting
- (iii) Being vigilant about dumping and burning of wastes in their neighbourhood.
- (iv) The reports/feedback by Suchi Mithra/SHG can be submitted to the jurisdictional ward committee which can be discussed at periodic meetings of members of the Suchi Mithras/SHGs and ward committee, to ensure implementation of the SWM Rules 2016 within the ward.

## 4. Mandatory Reporting Requirements under SWM Rules 2016

### 4.1. Monitoring

SWM Rules 2016 stipulate regular monitoring of soil, water, and air quality around the municipal waste processing, treatment, and disposal facility. Operators of these facilities are responsible for regular monitoring of these parameters. KSPCB is required to monitor the compliance of standards for groundwater, ambient air, leachate, compost quality, and incineration as specified under Schedules I and II of the SWM Rules 2016. It has the power to suspend or cancel the authorization issued under SWM Rules 2016 any time, if the ULB or operator of the facility fails to operate the facility as per stipulated conditions.

### 4.2. Reporting

- (i) The operator of solid waste management facility is required to submit the annual report in prescribed form to the ULB on or before the 30<sup>th</sup> day of April every year.
- (ii) The ULB shall submit its annual report in a prescribed form to KSPCB or Pollution Committee and the Secretary-in-Charge of the Department of Urban Development and to the Director of Municipal Administration or Officer in –Charge of Urban local bodies in Karnataka on or before the 30<sup>th</sup> day of June every year.
- (iii) KSPCB shall prepare and submit the consolidated annual report to the CPCB and Ministry of Urban Development on the implementation of the SWM Rules 2016 and action taken against non-complying ULB by the 31<sup>st</sup> day of July of each year in prescribed form.

### 4.3. Review

- (i) Rule 12(b) requires the District Magistrate or District Collector or Deputy Commissioner to review the performance of the ULB, at least once in a quarter on waste segregation, processing, treatment and disposal and take corrective measures in consultation with the Commissioner or Director of

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Municipal Administration or Director of local bodies and secretary-in-charge of the State Urban Development.

- (ii) As per Rule 16(a), KSPCB should review implementation of SWM Rules 2016 at least twice a year in close coordination with concerned Directorate of Municipal Administration or Secretary-in-charge of State Urban Development Department.
- (iii) The State Level Advisory Body should meet at least one in every six months in line with Rule 23 to review the matters related to implementation of the SWM Rules 2016, state policy and strategy on solid waste management and give advice to state government for taking measures that are necessary for expeditious and appropriate implementation of the SWM Rules 2016.

## 5. Complaint Redressal System

Citizens can post their solid waste management related issues/complaints directly to central as well as state governments by using following web and mobile based applications:

- 5.1. **Swachhata-MoHUA App:** The Swachhata-MoHUA is the official mobile based application of Ministry of Housing and Urban Affairs which enables a citizen to complain about a civic-related issue (such as a garbage dump). Any citizen can post a complaint as per the categories given under various heads along with photographs of the issue. Once the complaint is received, it is forwarded to the appropriate ULB and thereafter, assigned to the concerned official (such as health officer, environmental engineer etc.) in charge of the particular ward. Regular updates in the form of push notifications are sent to the complainant on the status of complaint. Complainants may also reopen the complaint if they are not satisfied with the resolution of the complaint.
- 5.2. **Janahitha App:** Janahitha is a common complaint redressal system available on both web and mobile based platforms developed by Directorate of Municipal Administration, Government of Karnataka. This can be used to report complaints regarding any civic related issue in all ULBs in Karnataka except Bengaluru. Once complaint is lodged, it is assigned to the concerned official and the details of complaint along with the expected date of closure of the complaint are notified to both the complainant and the assignee (official). The complaint is automatically monitored and tracked, and updates are sent directly to the complainant on their registered email and mobile number.
- 5.3. **BBMP Sahaaya:** BBMP Sahaaya is an user friendly interface that receives requests through various methods including online system, mobile application, telephone call, social networks etc. from the citizens of Bengaluru and serves as one central system to report grievance across various departments including waste management. A 24x7 call center manages requests, follows up with concerned BBMP officers, tracks for resolution and closure. Once a complaint is lodged using Sahaaya, the call center assigns it to the concerned department officer responsible for that location, at ward level or zone level. The concerned department official is provided with phone number of the complainant for getting further details and clarifications on the reported issue. In cases when the complaint is not addressed in-time, the complaint is escalated within the BBMP for resolution. Once the issue is resolved, the complainant is asked to give his/her feedback to close the request and at such time, the complainant can also choose to re-open the complaint if not being satisfied with the resolution.

## 6. Grievance redressal mechanism for ULB employees & other sanitary workers

The grievance/complaint redressal mechanisms for pourakarmikas and other sanitary workers should be informed to such workers, especially the details about the following:

- (i) Manner of submitting complaint/grievance i.e. oral or written complaints and time limits within which these complaints need to be submitted.

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- (ii) Contact details of officers responsible for grievance redressal
- (iii) Response time for redressing grievances

The above details should be widely publicised among the ULB employees to ensure that the employees are aware of the grievance redressal mechanisms within the ULB and are able to make use of it as and when necessary. In addition the internal complaints committee should look into safety issues of pourakarmikas and other sanitary workers.

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## ANNEXURE F: STREET SWEEPING IN ULBs

### 1. Overview of the strategy on street sweeping

1.1. ULBs must ensure sweeping of roads/ streets, cutting of vegetation in public areas and cleaning of drains within its jurisdiction occur at regular intervals such that cleanliness and hygiene are maintained. The frequency of street sweeping could be determined by the ULB depending on the type of roads, density of population, commercial activity and other local conditions.

1.2. The ULB shall also ensure that the street sweeping and/or silt are not dumped in the storm drains running parallel to the roads/streets. The waste collected from street sweeping and cleaning of drains shall be transported separately to the designated sites.

1.3. ULBs need to adjust the street sweeping frequency based on the local conditions , broadly street sweeping can be divided into the following:

Type of street	Frequency of sweeping
Type A roads and streets located in shopping areas, markets, city centres, near bus stands, transportation hubs and other commercial areas.	One or two times in a day, depending on need (including Sundays and public holidays)
Type B roads and streets located in residential areas, schools and less densely populated areas	Once in two days (including Sundays and public holidays)
Type C roads and streets having no households or commercial establishments on either side	Once a week
Type D roads and streets in the outskirts where the dwellings are scattered	Depending on the need
Highways	Rarely necessary to sweep highways due to turbulence through motor traffic
Public parks and other open spaces	Twice a week
Special occasions such as festivals, public events and gatherings	Depending on the need

1.4. Street sweeping shall be carried out during less activity hours ( Eg early morning or late hours),. ULB shall ensure safety of the workers by providing them with the appropriate Personal Protective Equipment (PPE) such as gloves, boots masks, raincoats and uniform.

1.5. Depending on the manpower available, number of waste generators and quantity of waste generated, the ULB could have the same or different team of pourakarmikas for street sweeping and primary collection of solid waste. These pourakarmikas should also monitor the unauthorised dumping or burning of waste on the roads and open spaces and existence of black spots.

1.6. ULBs must provide appropriate tools and equipment to pourakarmikas for getting optimum efficiency in street sweeping. Efficiency of tools is also dependent upon the nature and quantum of work and will differ from a small ULB to a large ULB. It is recommended that ULB provide the following equipment to street sweepers. Any change by the ULB in these equipment and/or vehicles requires prior consent from the DMA.

TP and TMC	CMC and CC
Long handed Broom	Long handed Broom
Metal tray and plate	Metal tray and plate
Containerised handcart and wheeled bin	Containerised handcart/pushcart and wheeled bin
Tractor with covered trolley, mini tipper, tipper	Secondary storage bin

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truck	
	Compactor, mini tipper, tipper truck and tractor
	Mechanical street sweeper

### 2. *Processing and/or disposal of street sweepings*

The waste collected street sweepings and the drains shall not be mixed with the solid waste collected from door to door collection. The ULBs should place adequate number of temporary wheeled bins/wheel barrows for collection waste from street sweepings. The number and placement of such wheeled bins/wheel barrows required will depend on the area of the ULB, its population and waste generation patterns. The ULB should also ensure that the street sweeping and/or silt are not dumped in the storm drains running parallel to the roads/streets. The waste collected from street sweeping and cleaning of drains shall be transported separately to **(i)** appropriate processing facilities and and/or landfills in accordance with the chapter pertaining to processing in this Karnataka Policy; and **(ii)** temporary storage facilities for inert waste for onward transportation to appropriate processing or disposal facilities.

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## ANNEXURE G: GUIDANCE ON SETTING UP AND OPERATING A SANITARY LANDFILL AND OPTIONS FOR LEGACY WASTE, DUMPSITE MANAGEMENT

### 1. Overview of the strategy on landfilling

- 1.1. Landfilling of municipal solid waste is the least preferred option for waste management in the waste hierarchy. However, currently, most ULBs dispose/dump all streams of waste into open dumpsites and landfills. Such landfill sites pose numerous threats to the environment due to their unscientific design and indiscriminate disposal. Besides having an obnoxious appearance and emanating foul smell, they also release large amounts of hazardous and otherwise harmful chemicals to nearby ground water and to the air through leachate generation and landfill gaseous emissions respectively. Such release of chemicals contains a wide variety of potentially toxic and carcinogenic chemicals that poses a significant threat to human health and biodiversity in the surrounding environment. Leachate generated from such sites is so concentrated that small amounts of leachate can pollute large amounts of groundwater rendering it unfit for use. Gaseous emissions generating from landfill sites comprise mainly of greenhouse gases like methane that have an adverse impact on the carbon footprint of the area and makes the site prone to explosions. Furthermore, these sites provide for incubation and proliferation of flies, mosquitoes, pests and other disease causing micro-organisms which have a further adverse impact on human health (especially among children and elderly people) and environment.
- 1.2. It must be noted that the only landfills permitted under the SWM Rules 2016 are “sanitary landfills” and therefore, as a first step, ULBs must convert their existing landfills to sanitary landfills or set up new sanitary landfills as per the criteria set out in the SWM Rules 2016, CPCB guidelines and other applicable regulations. As per KSPCB annual report 2016-17, the current status of identification and procurement of sanitary landfill sites in Karnataka is as follows:

Status of landfill site	No. of ULBs
Landfill sites possessed	227
Yet to procure landfill site	62
Common landfill site	2
Landfill site with basic infrastructure	198
Sanitary landfill developed	52

- 1.3. Given that the municipal solid waste management system in the state of Karnataka has not yet reached a stage where landfilling can be avoided, guidelines for setting up of sanitary landfills and its operations are detailed out for the ULBs in this Karnataka Policy. Under SWM Rules 2016, ULBs are required to stop land filling or dumping of mixed waste soon after the specified timelines for setting up and operationalisation of sanitary landfills are over. Further, the ULBs are required to make every effort to recycle or reuse rejects to achieve the desired objective of zero waste going to sanitary landfills.

### 2. Strategy for sanitary landfills:

- 2.1. The SWM Rules 2016 have laid out detailed specifications for sanitary landfill development and maintenance under Schedule I. These must be strictly followed by the ULBs while designing and setting up the sanitary landfills. All landfill sites should also get necessary clearances under environmental clearances from KSPCB and State Environmental Impact Assessment (EIA) authorities.
- 2.2. ULBs shall ensure that sanitary landfilling of waste starts only after all the mandatory facilities approved by the concerned authorities are developed and functional. There should be no open dumping in the designated sanitary landfill site.

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- 2.3. At present, no ULB in Karnataka charges a tipping fee for disposing waste in landfills. Typically such fee is charged based upon the quantity of waste dumped for landfill at the disposal site. ULBs may charge additional landfill fees that are linked to quantity of waste being disposed at the sanitary landfills along with the regular SWM SWM service charges from waste generators for sustaining the operations at sanitary landfill. Such fee must be the highest among all processing tipping fees to serve as a deterrent for indiscriminate dumping of waste and designed to reflect operating costs, especially the costs of environmental control as, closure, post closure maintenance and liability.
- 2.4. In ULBs which have a population of below 0.5 million it is recommended to participate in a cluster approach as the cost incurred in developing individual sanitary landfill facility will be significantly higher than the capital and operational costs incurred for a regional facility. Also, priority can be given to those sites where infrastructure has already been developed. For example, Bagalkot district generates a total of 192 TPD of municipal solid waste. Out of 15 ULBs falling under the Bagalkot district 6 have already possessed landfill sites. In such case, it is suggested that district administration can reconsider the development of individual facilities and instead, replace such individual facilities with a common facility with sufficient area that can cater to more than one ULB. This common facility should be within a feasible distance for transportation for the respective ULBs. In cases, where transportation cost is becoming high due to travel distance, the frequency of transport of waste to landfills should be adjusted along with an interim safe storing point (in conformity with the SWM Rules 2016) within respective ULB. Those sites where development has not yet started, efforts can be made to setup a common facility integrated with facilities for sorting, composting and refuse derived fuel (RDF). This will ensure that minimum amount of waste is disposed in the landfills and costs for transportation and manpower is reduced.

### *3. Overview of existing waste and open dumpsites*

- 3.1. Open and unauthorised dumping of solid waste is occurring in almost all the ULBs in Karnataka for many years and this has resulted in several unscientific and harmful dumpsites and landfills across the ULBs. Many open solid waste dumpsites in Karnataka including abandoned quarries do not have an engineered liner system, leachate collection system, or an appropriately designed cover system, thus posing a threat to the environment and human health. Such dumpsites and quarries should be immediately closed in a sustainable and phased manner in accordance with the SWM Rules 2016 and guidelines issued by KSPCB and CPCB from time to time to minimise their impact on land, groundwater, surface water and air quality in the vicinity of the dumpsite. At present, accurate and complete data on existing waste and dumpsites is not available and therefore all the dumpsites in Karnataka can be broadly classified into 3 categories namely:
- (i) **Old open dumpsites:** These are the sites which do not receive the waste and have been either abandoned or reached their full capacity.
  - (ii) **Existing operational dumpsites:** Authorised sites where dumping of solid waste is still being carried out, but principles of sanitary landfilling are not followed.
  - (iii) **Unauthorised dumpsites:** These refer to the private or public places other than the authorised sites where open dumping is being carried out in an unaccounted and illegal manner.

### *4. Dumpsite Management*

The key challenge in dumpsite management is to decide whether a site must be closed/ rehabilitated or remediated based on environmental risks posed by it. This decision must be taken after technical investigations and rapid risk assessments in consultation with the interested and affected parties. Priority shall be given to sites having high health risks, maximum environmental impacts, public concerns and

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minimum rehabilitation costs. ULBs should furnish all the information as per CPCB guidelines<sup>3</sup> and checklist for evaluation of landfill proposals with information on existing landfills. Once a decision for closure/rehabilitation/remediation is taken, the dumpsite management shall be taken up in phased manner to ensure minimum environment impacts.

## 4.1. Old abandoned open dumpsites

The following options can be examined for all the old open dumpsites which have stopped receiving solid waste or have reached their full capacity:

- (i) **Closure with a top cover** to prevent rainwater infiltration is an immediate and effective way to lessen the nuisance caused by the open dumpsites. Leachate generation from old dumpsites is a major environmental hazard and providing a top cover with HDPE liner will reduce the leachate generation. Gas collection/flaring system must be installed by digging gas wells into the waste dump at a depth equivalent to the average height of landfill from the ground level. Existing site shall be graded to an overall stable slope of 1(vertical):3(horizontal).
- (ii) **Reclamation of dumpsite through biomining/bio remediation** involves excavation, screening and separation of material from dumpsites into various components. It can be done with the help of technologies like biomining<sup>4</sup> or appropriate in-situ or ex-situ bioremediation technologies viz. bioventing, bio-sparging, phytoremediation etc. or a combination based on the assessment of dumpsite. It may also result in creating an additional space for future dumping depending upon the suitability of site for sanitary landfilling.

## 4.2. Operational dumpsites

Operational dumpsites which are still receiving waste must be managed considering the shortage of existing facilities to accommodate and handle the existing waste. Following options are available for existing dumpsites.

- (i) **Closure of old waste dump with cover:** This can be done by considering a stable slope of minimum 1:3 and capping it with a top cover system to reduce water percolation. In areas close to water bodies, creek, and coastal zones, a vertical cut-off wall should be planned at an appropriate depth as per prescribed standards.
- (ii) **Shifting of waste to build a sanitary landfill:** In facilities where enough space is available to accommodate the waste, relocation might prove beneficial as it will reduce the cost and time of acquiring new land. In such cases existing waste might be shifted to one part and a sanitary landfill facility may be prepared in rest of the space as per CPCB guidelines and SWM Rules 2016. The relocated waste must be suitably capped or recovered through bio-mining or bio-remediation in conformity with the guidelines given by CPCB.
- (iii) **Reclamation:** Reclamation of operational dumpsite through biomining/bio remediation can be done if it stops receiving the waste or there is sufficient space to accommodate the existing waste in a part where it can be processed

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<sup>3</sup> Guidelines and checklist for evaluation of MSW Landfills proposals with information on existing landfills, 2008 found at <http://bit.ly/2A5C1ef>

<sup>4</sup> Biomining is a process that involves the segregation of part of a dumpsite to make a landfill and converting waste into compost, methane gas, bio-diesel, RDF. Compostable waste is removed through sieving and sold for use as soil enriches or for landscaping. Bio-mining eliminates leachate and landfill gases by performing “bioreactor” activities above-ground, in the form of bio-treated aerobic windrows for almost total recovery of waste.

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- (iv) **Phased upgradation from open dumpsites to sustainable landfills**<sup>5</sup>: This involves gradual upgrading the uncontrolled open dumpsite into a controlled<sup>6</sup> dumpsite and ultimately to sustainable landfills. Minimal site infrastructure or facilities are installed and hence it is a more practical and sustainable option in terms of financial and environmental impact. This involves process improvement in terms of waste coming to the landfill and is highly dependent on other reforms in the current waste management system.

## 4.3. Unaccounted waste and unauthorised dumpsites

The major problem with these dumpsites is their absence in the records of the ULBs. These dumpsites are unauthorised and are mostly present in the residential and industrial areas. Following steps shall be taken to manage such dumps once identified within the jurisdiction of the ULB.

- (i) Clearing of existing black spots
- (ii) Restricting the further incoming of waste in these sites by notifying the people around, placing boards and banners and imposing penalties.
- (iii) Relocating waste to nearby waste segregation or processing facilities or landfills based on the type of solid waste.

## 4.4. Expansion of existing waste dump or landfill

Once the existing waste dumps or landfills without liner are closed, horizontal expansion can be taken up in the form of:

- (i) a new landfill adjacent to the existing dump which has been closed.
- (ii) new landfill constructed adjacent to the existing dump by making space for it by relocating existing waste from the sides of the waste dump to its top and then closing the waste dump.

The expansion of landfill is also required to conform to the guidelines and check-list for evaluation of landfill proposals as prescribed by CPCB<sup>7</sup>. The vertical expansion by placing cover on the waste dump and filling above the cover is discouraged owing to the risks and danger of poor performance, fire and collapsing.

## 4.5. Post closure of dumpsites

After the closure of open dumpsites, decomposition of closed waste will result in production of greenhouse gases and leachate. Therefore, a post closure plan shall be developed for maintenance and monitoring of the site<sup>8</sup> for a period of at least 15 years. After 3 years from complete cessation of leachate generation and ascertaining safety and requirement of relevant controls, the closed dumpsite may be used for the development of urban SWM parks or plantation.

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<sup>5</sup> Dumpsite Rehabilitation found at <http://bit.ly/2Og2XLe>

<sup>6</sup> Controlled dumpsites are non-engineered disposal sites where improvements made are mainly on the operational and management aspects of the site

<sup>7</sup> Guidelines and Check-list for evaluation of MSW Landfills proposals with Information on existing landfills found at <https://bit.ly/2uYjEBZ>

<sup>8</sup> CPCB - Guidelines on Odour Monitoring and Management in Urban Municipal Solid Waste (MSW) Landfill Site (Feb 2017) found at <http://bit.ly/2LxMPGh>

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## ANNEXURE H: PUBLIC INFORMATION, EDUCATION AND COMMUNICATION

### 1. *Introduction*

Public information, education and communication are multilevel tools for promoting and sustaining changes in individual and communities. It is a complex web of factors that affect behaviour change and a mix of sustained and regular interventions are needed to motivate and sustain new behaviours for efficient waste management. The state of Karnataka recognizes that the success of any waste management program depends as much upon organisational support and co-operation between households, communities, NGOs, other stakeholders and ULBs as it does upon selection and application of appropriate technical solutions for various waste management activities.

### 2. *Objectives*

The overarching objective is to bring about an efficient, effective and integrated waste management communication program to enable people and communities move towards sustainable behaviors – which includes adoption of waste hierarchy, explore sustainable alternatives and support decent and safe livelihoods to pourakarmikas, informal waste sector and other sanitary workers. In this contest the broad objectives of the state's IEC initiatives are:

- (i) To ensure no littering
- (ii) To promote waste minimisation, sustainable alternatives including sustainable menstrual and diapering products/practices and encourage zero waste lifestyle among communities
- (iii) Promote 3-way segregation of waste at source (i.e. into biodegradable, non-biodegradable and domestic hazardous categories) and handing over of segregate waste for collection
- (iv) To promote awareness of waste as a resource and to encourage re-use, recycling and home/community composting including health and environmental benefits of these waste management practices.
- (v) To bring about an awareness of the different waste streams and their treatments and the importance of no dumping and burning of waste.
- (vi) To raise awareness about municipal workers, safai karmacharis, waste pickers and other waste collectors and respect the work done by such workers.
- (vii) To provide information relating to user fees for solid waste management services, incentive and penalties for non-compliance.

### 3. *Planning and development of IEC activities*

#### 3.1. **Identification of relevant ULB department/officials**

- (i) As a first step, ULBs must identify the department and/or officials who will be responsible for IEC activities within the ULB. Such department and/or officials of the ULB will be responsible for developing a plan for dissemination of information about the solid waste management activities to the public. This plan should be aligned with this strategy detailed project report prepared for the ULB and other state level directions. The IEC plan should thereafter be implemented and executed at the ward/zone level with help of internal/external stakeholders.
- (ii) The officer in-charge of IEC should plan out the different activities to be carried out as part of information dissemination with timelines associated with the activities. The IEC implementation activities should be made for different target audience using appropriate modes of communication for each year of implementation. The IEC plan should identify the resources required for implementation (financial as well as institutional) as well as the mobilization method. It is recognised that communication is not a single time activity, but a sustained campaign using multiple modes, mediums, formats and content. Therefore, the information dissemination and awareness campaigns should be spaced out across the entire duration of the solid waste management implementation of the ULB. The office in-charge could outsource preparation and

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implementation of IEC activities to reputed agencies having relevant experience if it does not have sufficient in-house capacity. These could be non-governmental and/or community organisations, social enterprises, consultants or research institutes working in the domain of waste management. Such agencies could assist in the following activities:

- (a) Content development (based on inputs provided by the ULB)
- (b) Execution of street plays, short films/documentaries, hoardings, posters/banners/cartoons, quiz shows, art competitions
- (c) Door-to-door awareness
- (d) Capacity building of ULB staff involved in waste management IEC activities

### 3.2. IEC target audience and stakeholders

- (i) The IEC campaigns should be designed to target different generators of waste like households, shops, commercial establishments, bulk waste generators and educational institutions. Other stakeholders include municipal officials/ ULB staff, waste collectors, waste transporters, elected representatives, non-government organisations (NGOs), the informal sector, media, enterprises working on waste management and recycling etc.
- (ii) The IEC campaigns should be run with the support of resident welfare associations (RWAs), community-based organisation (CBOs), non-government organisations (NGOs), self-help groups (SHGs), rotary clubs, schools and social organisations along with the elected representatives and officials. These agencies can play an important role in spreading public awareness and encouraging public participation in SWM programs and can act as a bridge between the ULB and the community.

### Overview of IEC activities

SWM Issue	Target Audience	Objective
Generation	<ul style="list-style-type: none"> <li>▪ All waste generators in the city including informal settlements and floating population.</li> <li>▪ Vendors, commercial establishments, markets and other distributors of plastic products.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Reduce amount of waste generated</li> <li>▪ Karnataka State Plastic Ban</li> <li>▪ Promote reuse and recycling</li> </ul>
Littering	Community	Prevent open littering by communicating penalties for littering
Burning of Waste	ULB staff, community, floating population (focus on informal workers, low income group localities)	<ul style="list-style-type: none"> <li>▪ Prevent burning of waste as a disposal option.</li> <li>▪ Dissuade and prevent open burning of waste for heating (in ULBs during harsh winters)</li> </ul>
Waste Segregation	All waste generators such as households, commercial establishments, institutions and ULB staff.	<ul style="list-style-type: none"> <li>▪ Ensure segregation at source.</li> <li>▪ Communicate importance of waste segregation in ensuring sustainable management of waste, performance of processing and treatment systems, and health and environmental aspects</li> </ul>
Door-to-door Collection	<ul style="list-style-type: none"> <li>▪ Waste generators serviced by door-to door collection (e.g., households, commercial establishments, markets, institutions, etc.)</li> <li>▪ ULB staff, NGOs, RWAs, etc. responsible for door to-door</li> </ul>	<ul style="list-style-type: none"> <li>▪ Provide information on level of segregation required.</li> <li>▪ Provide information on waste collection schedule for different waste categories (where applicable).</li> <li>▪ Provide information on timings of collection.</li> </ul>

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	collection	
Secondary Collection and transportation	<ul style="list-style-type: none"> <li>▪ Agencies involved in transportation of waste</li> <li>▪ Sanitary inspectors and other SWM department staff in solid waste management activities.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ensure segregated transportation of waste as per collection schedule and SWM plan.</li> <li>▪ Ensure adoption of best practices, efficient transportation of waste to avoid illegal dumping and malpractices.</li> </ul>
Waste treatment or processing	Community, SWM department staff, agencies, NGOs, and formal and informal recyclers, involved in solid waste processing of treatment	<ul style="list-style-type: none"> <li>▪ Information on need for segregation for improved efficiency of waste treatment and processing.</li> <li>▪ Need for home composting/biomethanation, lane composting and Community waste processing facilities</li> <li>▪ Information on planned treatment and processing facilities</li> <li>▪ Information on environmental safeguards in SWM treatment and processing</li> <li>▪ Information on monitoring and reporting requirements</li> <li>▪ Information on by-products of processing such as compost, biogas, recycled products, RDF etc.</li> </ul>
Waste disposal	Community, SWM department staff, agencies, private agencies, and formal and informal recyclers involved in disposal of solid waste.	<p>Disseminate the following:</p> <ul style="list-style-type: none"> <li>▪ Information on waste disposal plans of the ULB</li> <li>▪ Information on environmental safeguards in SWM disposal facilities</li> <li>▪ Information on monitoring and reporting requirements</li> </ul>

Source: Municipal Solid Waste Management Manual Part II: The Manual, CPHEEO, Ministry of Urban Development

### 3.3. IEC content and topics

- (i) For the IEC campaign to be effective, a multi-level plan involving different modes of communication needs to be evolved given that for different target segments, different types of messaging are effective. The campaigns and messaging need to be regular.
- (ii) All communication so designed will be clear, crisp, jargon free, non-technical, and positive. The State will facilitate standard content, which can be modified based on the requirements of the ULB. The ULB should change and adapt IEC content and medium depending on the target audience, the segment of waste management systems which require citizen support and the goals/results that the ULB seeks to achieve.
- (iii) There should be consistent branding – at the State and ULB levels with adoption of synergies at different levels. For example, having a logo, mascot and tagline for the solid waste program greatly enhances the effectiveness of the IEC campaign and helps connect the messaging on different platforms in the minds of the target audience.
- (iv) In order to create a public recall for the messaging, a standardized branding approach should be adopted in all public places like tourist spots, railway stations, airports, bust stands and markets. This will also have the advantage of reaching to a large floating population and make them aware of their responsibilities in discharging their civic duties towards maintaining cleanliness.
- (v) The messaging should focus on creating awareness about the problem of waste, motivating people to change their current habits, actions that they need to take to sustain behavioural change.

### 3.4. Modes of Communication

The following medium of information dissemination can be used:

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- (i) Direct interaction: Face to face engagement through door-to-door campaigns, counselling, citizen meetings, motivational sessions among others.
- (ii) Print Medium: Advertisements and articles at regular intervals in newspaper/magazines in both English and local language. This should have text based as well as prominently pictorial messaging to target different sections of the society.
- (iii) Audio/visual means: Radio and television help in large scale dissemination of information. The messaging could be through interviews and snippets about the waste management initiatives and programs on radio and TV channels featuring celebrity ambassadors, municipal authorities and other stakeholders. The content could also include waste management success stories, sanitary worker stories, short films, animation/cartoons on different components of waste management.
- (iv) Digital platforms: Building a website for the SWM program pertaining to the ULB is a very useful means to connect with the public and provide all relevant information at a single place. The website needs to be vibrant, interesting, informative, topical and should be updated regularly so that data is not outdated. The website should contain the following:
  - Government laws, policies and guidelines relating to SWM including court rulings and directives
  - Technical and financial details of SWM
  - Swachh Bharat Mission implementation structure at State/ULB/Town level with details of responsible officers
  - IEC, training and awareness material relating to SWM
  - List of NGOs, equipment/technology providers, consultants, research institutes, certifying agencies, private sector players involved in SWM
  - Compilation of appropriate research papers and publications, national and international on MSW management.
- (i) Social media platforms like Facebook, Twitter, Instagram, WhatsApp should be used widely to spread the message and get the youth engaged with the issues of waste management.
- (ii) Community engagement programs: Messaging through public events like marathons, exhibitions, flea markets, compost santhes sports events, wall paintings, religious festivals, cleaning of black spots etc. In cities like Bangalore, the concept of ward level composting santhes have been extremely successful in spreading awareness as well as encouraging community participation.
- (iii) Setting up interactive information centres which display different types of waste, the processing involved, the resources that can be recovered from such waste and the advantages of good handling and management practices.
- (iv) Celebrity endorsements, high-visibility brand ambassadors can result in publicity for the waste management practices of the ULB. In addition, sensitisation about health and environmental hazards due to improper waste management and promotion of source segregation are most effective when the IEC campaign is led by prominent public figures and the head of the ULB.
- (v) Students as target group as well as ambassadors: Schools should include solid waste management in their curriculum and students should be encouraged to propagate the message through rallies, street plays, songs/poems/stories. They should organize quiz competitions, essays, painting completions, poster making etc on the theme of waste. Field visits to waste management centers and recycling facilities should be part of the school curriculum.
- (vi) All staff uniform and vehicles involved in the SWM services shall have advisory and awareness messages about solid waste management especially messages pertaining to importance of source segregation, door to door collection, need for community participation etc.

### 3.5. Ranking of wards/ULBs

Ranking and recognition is a positive way to engage citizens, ULB officials and encourage improvement in SWM activities. The state has instituted an award, Uthama Swachha Nagar for best performance in solid waste management by ULBs. For this, the state should devise definitive parameters as well as assessment tools to identify the best performing ULB. Similarly, ULBs can assess ward level performance in segregation,

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littering, door to door collection etc. and publish the rankings. Some incentives like improving infrastructure in the parks/ making pavements etc. can also be provided to the ward with best performance.

### **3.6. Fund Allocation and monitoring**

- (i) All ULBs must mandatorily keep aside adequate funds in their solid waste management budgets for IEC activities. Along with funds available under Swachh Bharat Mission (Urban) and other applicable schemes. The ULB can also use other state, central and municipal funds for IEC and behavioural change activities.
- (ii) ULBs should monitor the efficacy of the IEC content and mode of communication to understand the type and medium of content which is resulting in behavioural change among different stakeholders. In addition, the content and messaging should be reviewed periodically, such as once in two years for required changes. The effectiveness of the IEC campaign should be monitored by the DMA through Project Director (DUDC) and SWM section of the ULB at regular intervals. The monitoring should be done based on assessment of predefined impact measures of behavioural change and other quantifiable impacts like reduction in dump sites, reduced instances of waste being burnt, improvements in source segregation levels among others.

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## ANNEXURE G: SAFEGUARDING HEALTH, WELFARE AND DIGNITY OF POURAKARMIKAS AND OTHER SANITARY WORKERS

### 1. Introduction

The Karnataka State recognises the service rendered by the pourakarmikas over the decades in protecting the health of citizens and cleanliness of the cities. The strategy aims to ensure economic and social upliftment of pourakarmikas employed in solid waste management. Pourakarmikas and other sanitary workers being the largest workforce employed by local governments, there has been efforts to attend to their occupational health needs. However, enhanced systematic and sustainable efforts are required to provide them with supportive work environment at the ULB level.

### 2. Guiding Principles

The strategy adopts the following principles as the guiding principles to be followed in regard to pourakarmikas and the state shall strive to ensure that these principles are not violated or diluted:

- (i) The strategy recognizes that prevailing systems of waste management are majorly dependent on pourakarmikas and the service rendered by them in carrying out the obligatory functions of the local bodies in maintaining public health and cleanliness.
- (ii) The strategy recognizing the obligation of the State under Article 43 of the Constitution to secure to all workers, a living wage and conditions of work ensuring a decent standard of life, shall ensure that pourakarmikas are paid legal minimum wages, including applicable allowances and statutory benefits.
- (iii) The strategy recognizes that the dignity of labour shall be ensured by ensuring compliance of applicable labour laws, providing safe working environment, economic opportunity and social security for pourakarmikas engaged in the municipal waste services.
- (iv) The strategy recognizes that Article 46 of the Constitution mandates that the State shall promote with special care the educational and economic interests of the weaker sections of the people, and, in particular, of the Scheduled Castes and the Scheduled Tribes, and shall protect them from social injustice and all forms of exploitation. In light of the said obligation, the state undertakes to ensure the provision of quality education, housing, health services to pourakarmikas and take further steps for overall upliftment as per applicable government schemes.
- (v) The strategy recognizes that urbanization and increase in per capita waste generated leads to constant increase in the workload on the pourakarmikas. Therefore, the state will prescribe normative standards for manpower which is proportional to the work to be carried out. Further, with the increase in per capita waste produced, the number of pourakarmikas and normative standards will be re-evaluated at periodic intervals such as once in every three years.
- (vi) The strategy recognises that the workforce involved in solid waste management includes street sweepers, door-to-door collectors, drivers, helpers, loaders and workers in various processing units and ensures their protection under applicable laws.
- (vii) The strategy mandates that there shall be a specific focus on places with hilly terrain and recognises that ULBs having such terrain involve increased workload and stress for workers. Therefore, special focus will be on these areas to ensure that there are adequate workers' safety norms and normative standards. In addition, state can prescribe separate normative standards for such areas.
- (viii) The strategy recognizes that Article 43A of the Constitution mandates that the State shall take steps to secure the participation of workers in the management of undertakings, establishments and other organisations and taking cognizance of this mandate, shall ensure the participation of the pourakarmikas in SWM activities as it may be deemed necessary.
- (ix) The strategy recognizes and acknowledges that owing to the insufficient sewage networks, sanitary workers especially in smaller ULBs, are susceptible to manual scavenging. In this regard the Prohibition of

## Karnataka State Urban SWM Strategy

Employment as Manual Scavengers and their Rehabilitation Act, 2013 shall be implemented in full letter and spirit so as to protect the dignity and rights of workers.

### 3. *Specific welfare measures for Pourakarmikas*

- 3.1. **Wages and other benefits:** The state of Karnataka is committed for the welfare of pourakarmikas and other sanitary workers and is against any kind of exploitation. Therefore, it shall be ensured that there is regular and timely payment of wages/minimum wages, employee state insurance and provident fund along with any other statutory benefits to pourakarmikas. It was also noticed that, contract system of hiring pourakarmikas has led to exploitation of labour in some ULBs. In this context, ULBs need to institute direct payment of wages to pourakarmikas. Punitive measures shall be initiated by the ULBs for any proven violations of these commitments about safeguard of pourakarmikas.
- 3.2. **Housing:** Pourakarmika Gruha Bhagya Yojane was launched by the Karnataka State Government for providing housing accommodation to the permanent pourakarmikas who have completed 10 years of service. Under this is a welfare scheme, a house having a maximum area of 500 sq. ft will be constructed for pourakarmika by the ULB where out of the total cost, 80% of the cost amounting to a maximum of Rs. 6 lakhs shall be given by the state government while the remaining 20% amounting Rs. 1.5 lakh will be borne by the beneficiary pourakarmika.
- 3.3. **Occupational safety:** The nature of the work exposes the workers to occupational health hazards if personal safety equipment is not used. Therefore, as a preliminary urgent step, ULBs shall provide all the equipment and facilities detailed in the Notification bearing No. KaEe 71 LWA 2015 dated 04.08.2016, such as uniforms, gloves, caps, gumboots, raincoats, masks, safety goggles among others to pourakarmikas and other sanitary workers. The State Government shall take steps to continuously educate the workers regarding significance of protection equipment. Pourakarmikas will also be trained on the usage of such personal protective equipment and the need for effective utilisation of such equipment. In addition to the personal protective equipments, ULBs through its health and other appropriate department shall conduct regular medical check-ups of the pourakarmikas, drivers and other eligible employees for occupational diseases and treatment of injuries resulting from SWM activities.
- 3.4. **Gender Equality Aspects:** Pourakarmikas shall be extended safe, healthy and gender-friendly work environment. Gender-sensitive personal protective gears shall be enforced by the ULB and the equipment, machines and vehicles for handling waste shall be easy to operate and gender friendly. There shall be gender-friendly sanitation facilities including changing rooms attached to all waste management facilities such as DWCCs/MRFs, SWM processing plants, especially where women are engaged. The pourakarmikas and other sanitary workers need to be provided with access to rest rooms at free of cost in the ULBs.
- 3.5. **Other welfare measures:** The state Government and the ULB could also explore additional welfare measures such as insurance schemes, meals and vocational courses/opportunities and payment of school and college fees and financial assistance towards education of children of pourakarmikas, drivers etc. as per government guidelines. The ULB shall ensure issuance of identification cards to all pourakarmikas, drivers and other personnel who are employed directly by the ULB or on a contract basis and engaged in SWM activities. The ULB shall also provide potable drinking water, access to toilets, rest rooms, changing rooms and first-aid facilities to all the SWM workers working in DWCCs/MRFs and SWM processing facilities. To incentivise good performance, the ULB shall also consider instituting the best performance award for pourakarmikas in different wards within its jurisdiction. ULB shall explore the possibility of integrating pourakarmikas into with Government of India schemes such as Pradhan Mantri Jeevan Jyoti Bima Yojana, Pradhan Mantri Suraksha Bima Yojana and Arogya Kavacha among others.

## **Karnataka State Urban SWM Strategy**

In addition to the guidance set out in this strategy, the state will evolve specific guidelines for the welfare of pourakarmikas, their working conditions, normative standards, occupational safety and other critical requirements within two years from the adoption of this strategy.

# Karnataka State Urban SWM Strategy

## ANNEXURE H: INTEGRATION OF THE INFORMAL WASTE SECTOR INTO SOLID WASTE MANAGEMENT SYSTEMS

### 1. *Introduction*

- 1.1. Rule 11(c) of the SWM Rules 2016 directs that each States to prepare a state policy and solid waste management strategy that acknowledges the primary role played by the informal sector of waste pickers, collectors and recycling industry in reducing waste and provide broad guidelines regarding integration of these groups in the waste management system.
- 1.2. The informal sector is defined as the part of an economy that is characterised by private, usually small-scale, labour-intensive, unregistered, largely unregulated, and unregistered manufacturing or provision of services. In the waste management sector, they include the following players:
  - (i) Waste collectors and/or pickers who collect mainly reusable and recyclable solid waste directly from waste generators or public bins, road sides, public spaces, open dumpsites and landfills.
  - (ii) Itinerant buyers (or kabadiwalas)/Scrap Dealers who (a) aggregate the waste collected by the waste pickers and/or (b) function as micro-entrepreneurs who buy reusable and recyclable material such as newspaper, metal, glass, and plastics from households, commercial establishments and other waste generators and then re-sell them to large wholesalers who then either sell to larger aggregators or sell to recyclers.
  - (iii) Informal recyclers who either clean, dismantle or further sort waste in more specific categories or use rudimentary technology to transform the collected waste into another product and/or raw material that could be used for producing new products as per applicable law.

### 2. *Role played by the informal sector and the concerns*

- 2.1. Waste collection and trade of recyclable non-biodegradable waste in India is largely managed by the informal sector consisting of waste pickers and scrap dealers. The informal sector is the backbone of the solid waste value chain in India, recovering nearly 50% of recyclables generated by households. In doing so, the work done by the informal system results in reduction of waste going to landfills and decreases the depletion of natural resources which would have otherwise been used in production of new products.
- 2.2. Contribution of informal sector towards solid waste management is recognised by the State. Steps shall be taken by ULBs to ensure safe working/living environment for the informal sector dealing with waste management.
- 2.3. Informal sector has traditionally and uniquely looked at waste as 'resource' while people employed for just lifting and dumping waste treat it is as garbage. Over a period of time, the informal sector players have honed their abilities to be able to distinguish and sort different materials efficiently and their sorting accuracy is far better than most sophisticated sensor based systems.

### 3. *System for Integration of the informal recycling sector into the solid waste management system*

- 3.1. With the increased urbanization and related increase in waste, there is an urgent need to recognise the capacity of the informal sector and integrate them into main stream waste management activities. This will not only improve their livelihood conditions but also benefit the ULB. The approach suggested for inclusion of the informal sector consists of three parts:
  - (i) Identification: The waste pickers, waste sorters, itinerant buyers and the scrap dealers operating in the ULB including their area of work, residence, categories of waste they deal in and end destination need to be identified. The formal survey can be carried out by the ULB directly or through the NULM/NRLM Livelihood Centers, or the ULB can engage an NGO working on livelihood or

## Karnataka State Urban SWM Strategy

labour issues or any other organisation working on informal waste worker issues. ULB can thereafter, issue occupational identification cards either through authorised officers of ULB/ NULM City Livelihood Centers and NRLM to wastepickers and other informal waste workers above 18 years of age. The ULB will maintain a paper record of the survey for a period of seven years and will maintain electronic records, duly backed up.

- (ii) **Verification** The verification process can include an introduction letter from the Resident Welfare Association or Area Sabha, Ward Committee or Commercial complexes or Hotels and Companies stating that waste picker is picking up waste from their premise or proof of membership of any organisation.
- (iii) **Organisation:** The waste picker/ groups that are identified as providing SWM services by the ULB within its jurisdictions shall be encouraged and helped to get organised as SHGs, cooperatives, partnerships, for-profit entities or formally registered either as a not-for-profit organisation under the Societies Registration Act, 1860 or as a trust under Indian Trust Act, 1882.
- (iv) **Integration:** waste pickers SHGs or legal entities can be integrated in operations of dry waste collection centres and material recovery facilities or any other SWM works deemed to be appropriate by ULB and establish partnerships through MOU or contract. The ULB can develop a system to allot /assign Dry Waste Collection Centers/ Material Recovery facilities/ dry waste collection to registered wastepickers or enumerated scrap dealers, for operations. For access to finance and technology, the ULB will facilitate convergence between various schemes notified by the Central and State Governments such as Mudra Yojna, National Safaikarmacharis Finance Development Corporation Schemes, Startup India among others.

3.2. **Training and enhancement of skills:** The ULB along with assistance from the private sector, NGOs and community organisations shall impart training on best practices related to waste management and environmental, health and safety (EHS) standards to waste pickers, collectors and scrap dealers. The State Government shall take steps to continuously educate the workers regarding significance of personal protection equipment. The members of the informal waste sector will also be trained on the usage of such personal protective equipment and the need for effective utilisation of such equipment.

3.3. **Monitoring and Assessment:** The ULB shall set up robust monitoring and evaluation systems and process to monitor and evaluate the performance and sustainability of the SHGs/cooperatives, private entities and integrated informal workers. These can include (i) periodic reporting by the informal worker organisations on the waste management activities carried on by them on behalf of the ULB; and (ii) audits (including surprise audits) by the ULB and/or third party auditors appointed by it to ensure compliance with SWM Rules, service level benchmarks and health and safety norms. In case of non-compliance, the ULB can take penal measures such as cancellation of registration, identity cards and contracts/tenders for solid waste management activities.

#### 4. *Facilitate access to social security and health and other welfare provisions*

4.1. The ULB will facilitate convergence between National Health Mission or Aayushman Bharat, any other health schemes instituted by the Central and State Government for all enumerated waste-pickers.

4.2. The ULB will provide personal protection equipment to all wastepickers and other informal waste collectors including fluorescent jacket, hand gloves, rain coats, appropriate footwear, and masks periodically. In

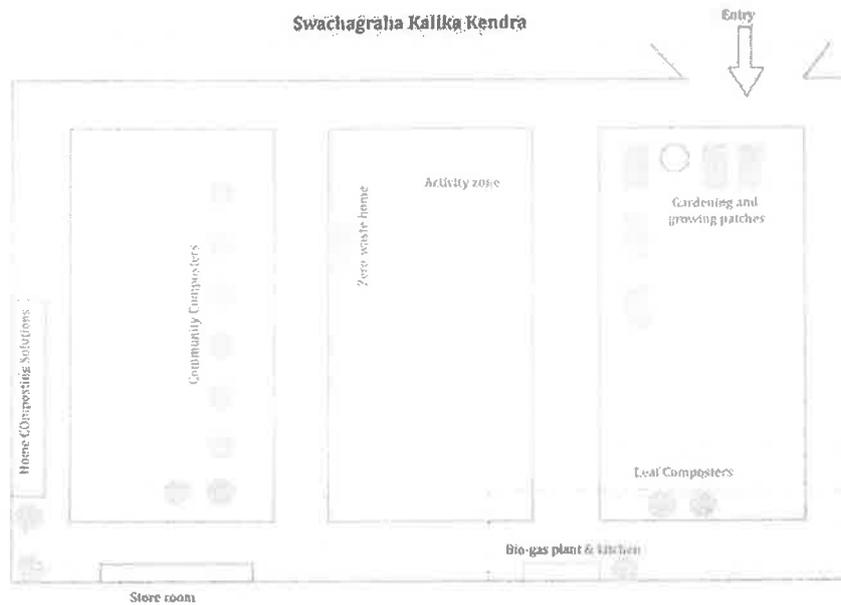
## **Karnataka State Urban SWM Strategy**

addition, the ULB will facilitate monthly health camps with the help of Government/Aided hospitals in different neighbourhoods.

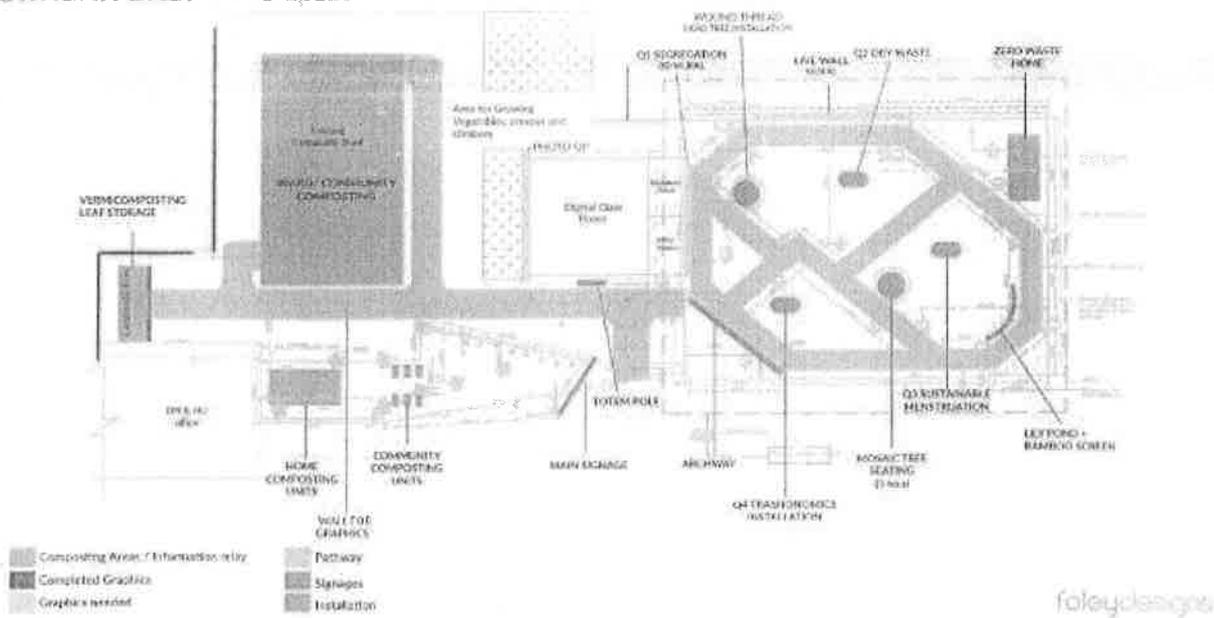
- 4.3. Sensitisation/ communication and capacity building of police, RWAs, municipal officers, municipal workers including pourakarmikas and safaikarmacharis and other citizens of informal waste workers' role and contributions. In this context, the ULB will ensure prevention of harassment of wastepickers and the other informal waste collectors.
- 4.4. The ULB will ensure that if wastepickers are employed in private facilities or MRFs operated by the private agencies, wastepickers will be provided with clean and functional toilets along with access to clean drinking water. The ULBs will facilitate free access to government toilets upon production of occupational ID cards.
- 4.5. The ULB will facilitate necessary scholarship programs for children of wastepickers as announced by the Central or State Governments

Annexure 1 -

SwachhGraha Kalika Kendra, HSR Layout  
LAYOUT - 1.5 Acres approx



SWACHH BADI The Space



Annexure -2

Installation Components

<b>COMPOST SECTION</b>	<b>DESCRIPTION</b>
1. HOME COMPOSTING SECTION	Display of all home composting units
2. COMMUNITY COMPOSTING SECTION	Display of all community composting units
3. VERMI COMPOSTING TANKS	Shed with Vermicomposting tanks
4. MICRO COMPOSTING SHED	Shed with windrow composting tanks
5. LEAF SHREDDER CUTTER SHED	Leaf shredding machine with conveyor belt
6. CURING TANK	Compost curing tanks
<b>GROW SECTION</b>	
1. FRUIT BEARING TREES	Wooded area
2. RAISED BEDS	Vegetable planting
3. LANDSCAPING	Decorative planting
<b>SHOW AND TELL SECTION</b>	
1. KNOWLEDGE SECTION	(1) Segregation at source (2) Dry waste (3) Sustainable Hygiene (4) Trashonomics
2. ZERO WASTE HOME	Walk through installation
3. ART INSTALLATION	Arches, Totem pole, signages, Displays
4. WALL ART	Use of all walls available for display
<b>OTHERS</b>	
1. CLASS ROOM AREA	Indoor or outdoor ( with overhead canopy) or both
2. COW SHED	Local breed cow
3. COMMON STORAGE	For Tools and equipments
4. TOILET	Minimum of a 3 seater toilet
5. DRINKING WATER	Drinking water facility
6. SECURITY ROOM	Security Room with Toilet attached

# SWACHAGRAHA KALIKA KENDRA

## HSR LAYOUT

### SCHEDULE OF CIVIL STRUCTURES AND INSTALLATIONS

#### CIVIL STRUCTURES:

##### HOME COMPOSTING CENTRE:

Enclosed space designed to view and display different home composting units.

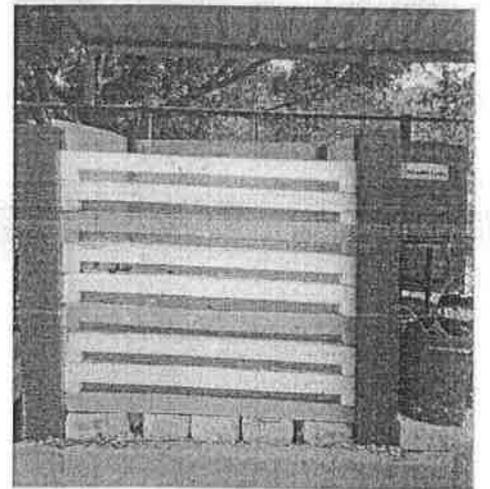
- Area- 34'2" x 6'2" x 7'.
- Accommodates 12 different units.
- 6 openable shutters (from sill to roof) to enable viewing.
- Materials: Concrete blocks, perforated metal sheets, transparent fiber glass sheet, metal brackets for bracing, metal rods for support, cement mortar and metal corrugated sheet roofing.



##### KERALA COMPOSTER:

Community composting unit.

- Area – 5' x 5' x 4'4"
- Linear concrete members stacked one above the other.
- The unit is shaded using metal framework and corrugated sheets.
- Materials: Cast concrete members, perforated metal sheets.



##### AEROBIC TANK DIGESTER:

A large tank with aeration system enabling aerobic digestion of waste (with presence of oxygen)

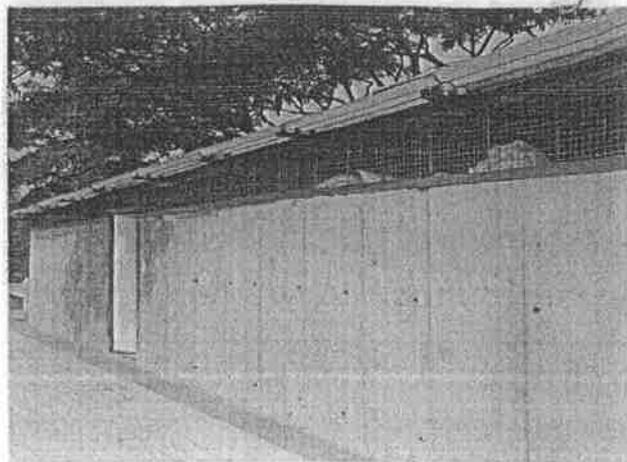
- Area – 7'3" x 5'1" x 4'
- The unit is shaded using metal framework and corrugated sheets.
- Materials: Concrete, oxygen pump system, concrete blocks, covering of perforated metal sheet, MS hollow sections, corrugated metal sheet (roof).



### STORE ROOM:

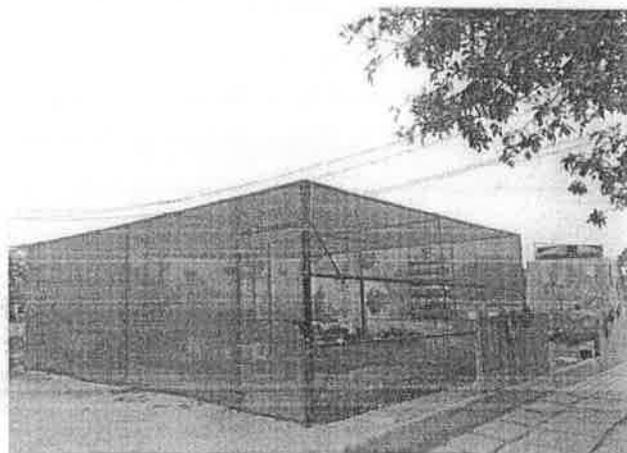
Enclosed space constructed using construction debris and swept dust.

- Area - 39'8" x 6' x 7'
- Materials: MS hollow sections for reinforcement, cement, construction debris, swept dust, Tetra Pak corrugated sheets for roofing, metal mesh for ventilation.



### PEDESTAL FOR WATER TANKS:

- Area - 6' x 6' x 2'3"
- Two units - for watering the trees and for the home garden



### NURSERY:

Contains different planters and growbags.

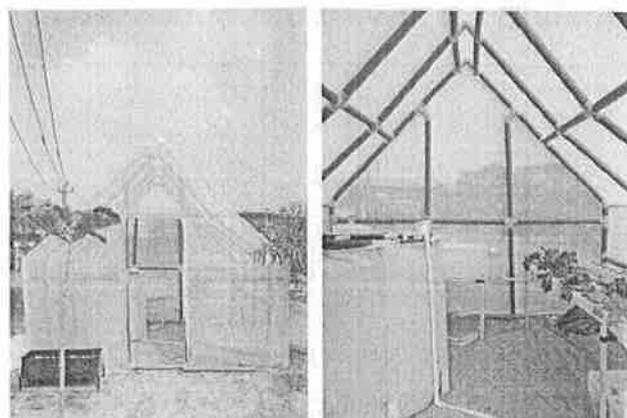
- Area- 18' x 22' x 7'6"
- Materials- MS framework, green shade net.



### AQUAPONICS AND HYDROPONICS:

A system that combines conventional aquaculture (raising aquatic animals in tanks) with hydroponics (cultivating plants in water) in a symbiotic environment.

- Area - 10'6" x 10'6" x 10'
- Materials: PVC pipe framework, plastic net, plastic sheets, aluminium sections, aquaponics system, hydroponics system.

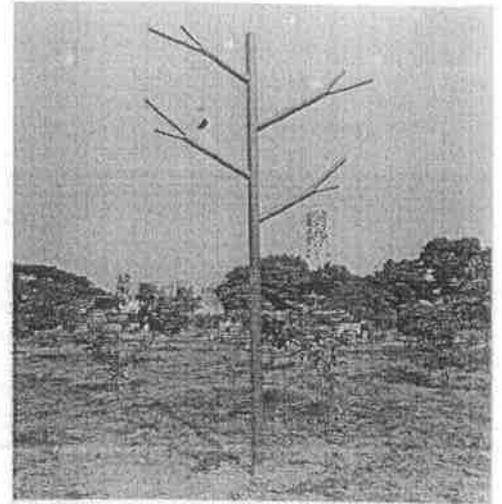


## INSTALLATIONS:

### METAL TREE INSTALLATION:

A tree like structure to display upcycled decorations.

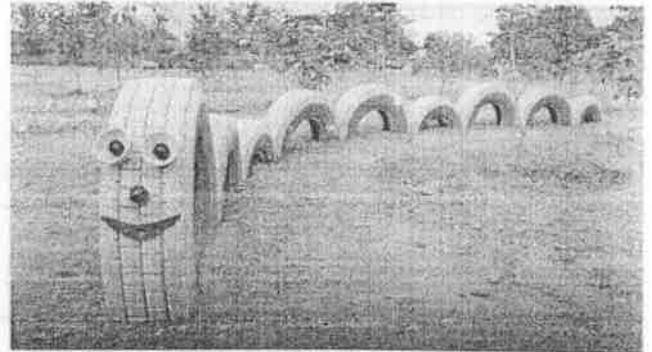
- Materials: MS pipe, concrete footing.
- Area of footing – 3' x 3' x 4'



### TYRE SEATING INSTALLATION (EARTHWORM):

Tyres upcycled to form a seating area in the shape of a friendly earthworm.

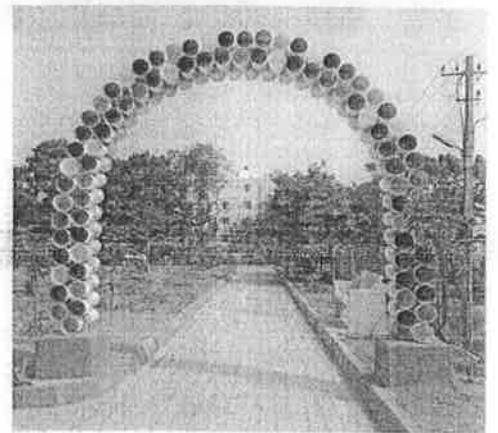
- 9 large tyres placed at different heights.
- Materials: Tyres, paint, plastic containers.



### PAINT CAN ARCH:

A decorative arch made by upcycling paint cans.

- Materials: MS box sections framework, concrete footing, paint cans, bolts and nuts.



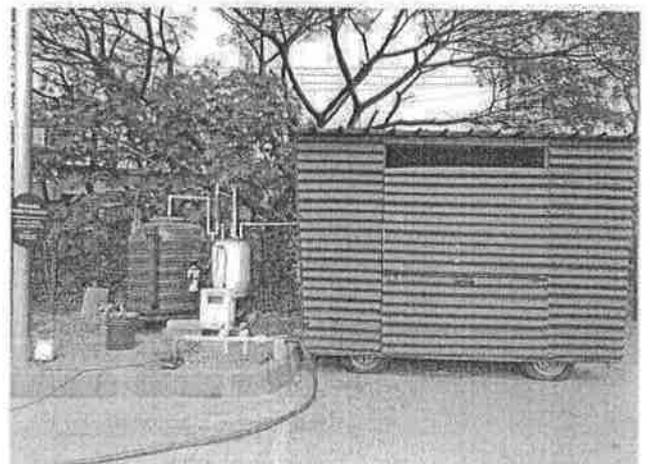
### BIOGAS PLANT (RENEWABLE ENERGY CORPORATION):

- Area: 5' x 5'

### KITCHEN INSTALLATION:

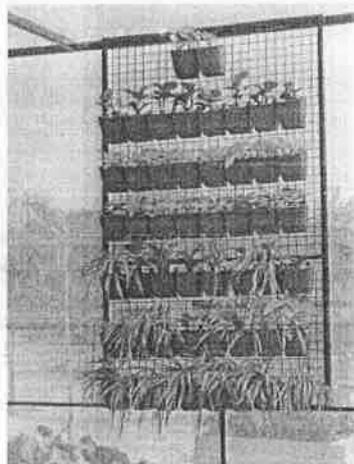
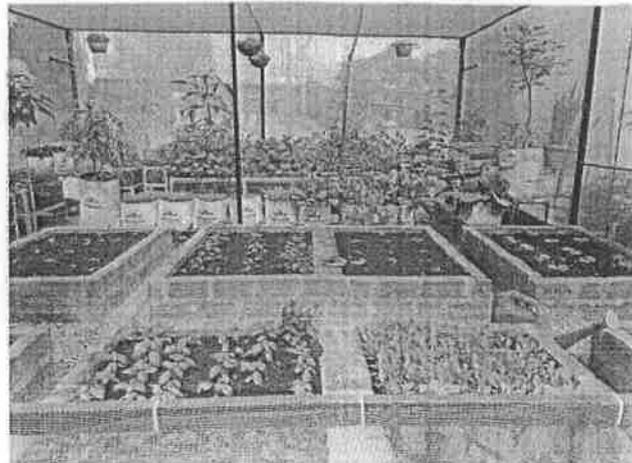
Upcycled automobile converted into a small kitchen that is attached to the Biogas plant.

- Area – 10'6" x 5' x 8'
- Materials: Upcycled automobile, Corrugated sheets and box sections for structural support.



## HOME GARDEN:

- Wooden crate planters- 8 nos. (3'x2')
- Fiber glass planters- 6 nos. (3'x2')
- Slotted angle planters- 14 nos. (3'x2')
- Brick planters- 8 nos. (3'x4')
- Rectangle plant beds- 4 nos. (8'x6'6")
- Circular plant bed- 1 no. (radius-5'6")
- Wooden frame for vines- 1 no. Adjacent to 2 crates. (12'x4'6"x2'6")
- Vertical planter unit- 3'x5'(ht)
- Metal stands and pedestals for grow bags and pots- 8 nos. (assorted types and sizes)



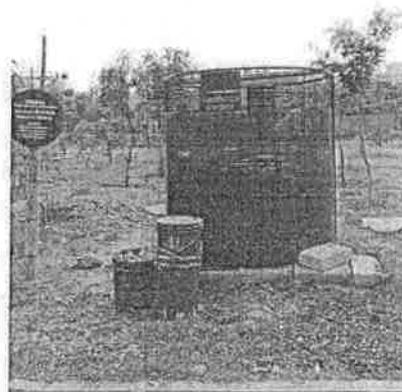
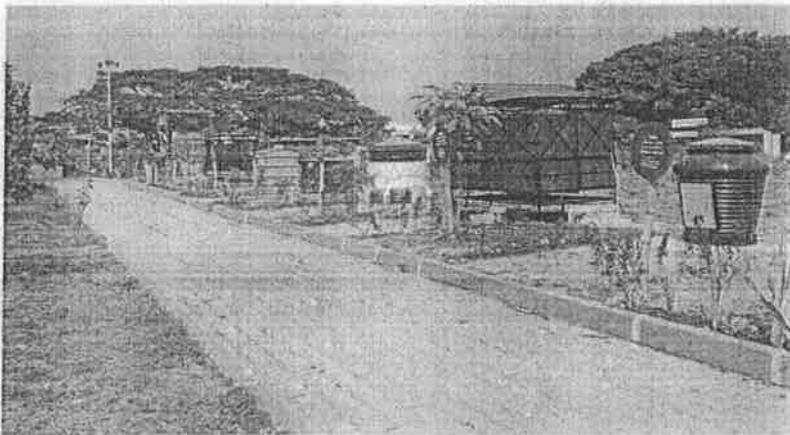
DUSTBINS: 8 nos.

## HOME COMPOSTER UNITS:

Unit	Daily capacity (kg)	Total capacity (kg)
Do It Yourself	1	30
Badki	2	55 lts
Majli	1	30 lts
Chutki	0.5	16 lts
Quantum Leaf Bokashi Bin	1.2	22
Honey Bee	0.7-1	30 lts
Sintex Vermicompost Kit	1	40
Small Khamba	0.5	30
Orbin Solo	2-3	80
Twin Drum Home	1	60
Blue Digester	5	220

COMMUNITY COMPOSTING UNITS:

Unit	Daily Capacity (kg)	Total Capacity (kg)	Area Required
Morph	4-5	200 lts	4'x4'
Continuous Composter	25	750	15'x4'
Byo Bin	12-15	450	1mx1mx1m
Orbin Stax	30-40	800	5'x5'
Green FRP Digester	50	2200	1.5mx2mx1m
Twin Bin FRP Composter	30-35	900	4'x3'x3.6'
Aaditi Large	50	1100 lts	40"x48"x36"
Marigold	30	250	2mx2mx1.5m
Ghana	40-50	3000	10'x10'x6'
Aaga	20	300	1mx1mx1m
Biodynamic Composting		Upto 2 tons	1.5m x 2m pit
Shishira	10-20	2500	1m x 1m



## SIGNAGE:

All signage are ACP mounted on structural supports.

Materials used: Bamboo, MS box sections, MS pipe, GI wire, wooden members, corrugated metal sheet.

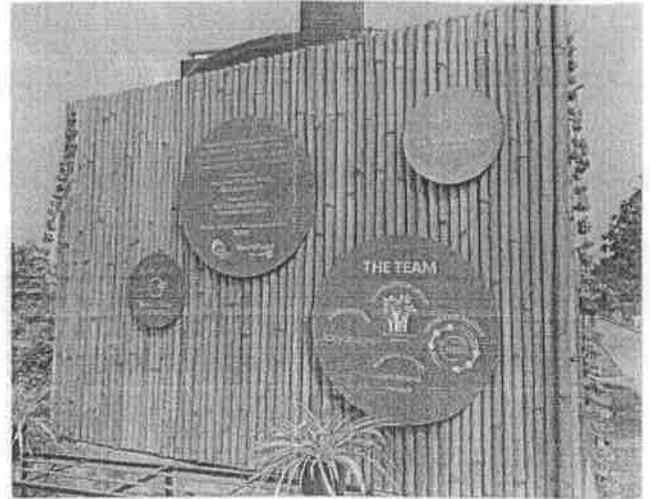
Bamboo Fence Signage: 13nos

Bamboo pole (single): 12

Bamboo pole (double): 2

Information Board: 2nos

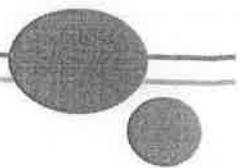
Information Tree: 3nos (1 big, 2 small)



## SCHEDULE OF THE ACP PRINTS:

Size (mm)	Number of units
300x300	8
450x450	34
500x500	11
600x600	4
800x800	1
Rectangle - 500x700	2
Home composting center banner - 2700x450	1
SwachaGraha Kalika Kendra banner - 5029x660	1

SWACHHA BADI, SIDDIPET, TELANGANA  
( based on the SwachaGraha Kalika Kendra concept)



COMMUNITY  
COMPOSTING  
Displays a number of  
options

VERMI  
COMPOSTING  
UNIT

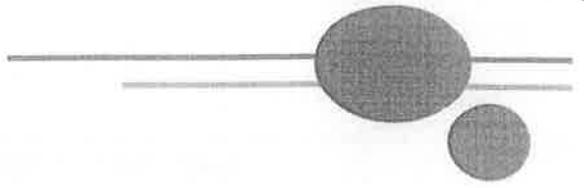


MICRO  
COMPOSTING  
SHED

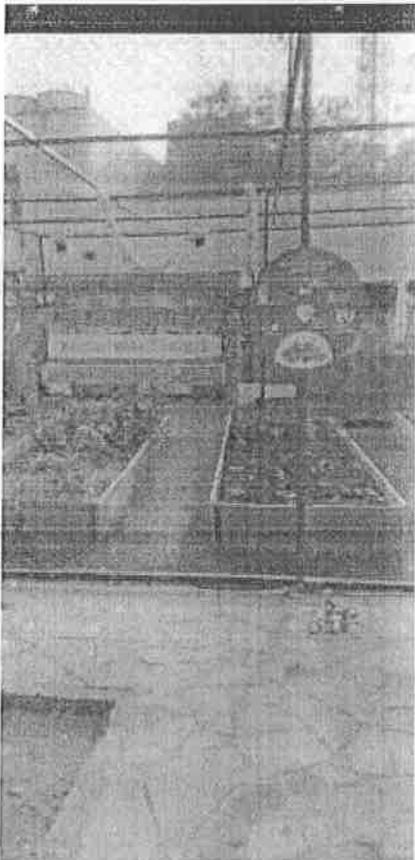


LEAF  
COMPOSTING  
SHED

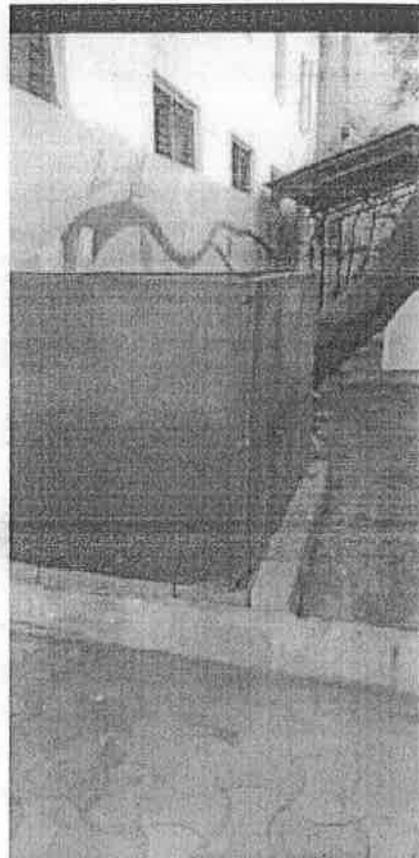




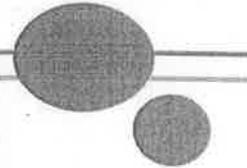
GROWING  
SECTION



COMPOST  
CURING TANKS



RECYCLED ART INSTALLATIONS



ZERO WASTE HOME



DRY WASTE  
INFORMATION  
SECTION

## The inauguration of the first SwachaGraha Kalika Kendra at HSR Layout

Sri Gurumurthy Reddy  
Chief Guest

**HSR Citizen Forum**

take great pleasure in inviting you for the inauguration of

**SwachaGraha Kalika Kendra**  
 Composting Learning Centre

On December 15, 2018 at 10 am

Inauguration by  
**Sri M Satish Reddy**  
Minister, Bangalore

Chief Guest  
**Smt. Gajagambike Mallikarjuna**  
Minister, Bangalore

**Sri. Bhadrage Gowda**  
Minister, Bangalore

**Chairman**  
Health Committee

**Special Guests:**  
 Sri Manjunath Prasad

SwachaGraha Kalika Kendra... is an exciting, leading entity, the first of its kind in Bangalore, which will play a crucial role in ensuring widespread adoption of composting and ensuring safe food & vegetable waste management. This center shall cater to more than 30 composting societies and a fully functional Bengaluru. Let's be part of this composting revolution.







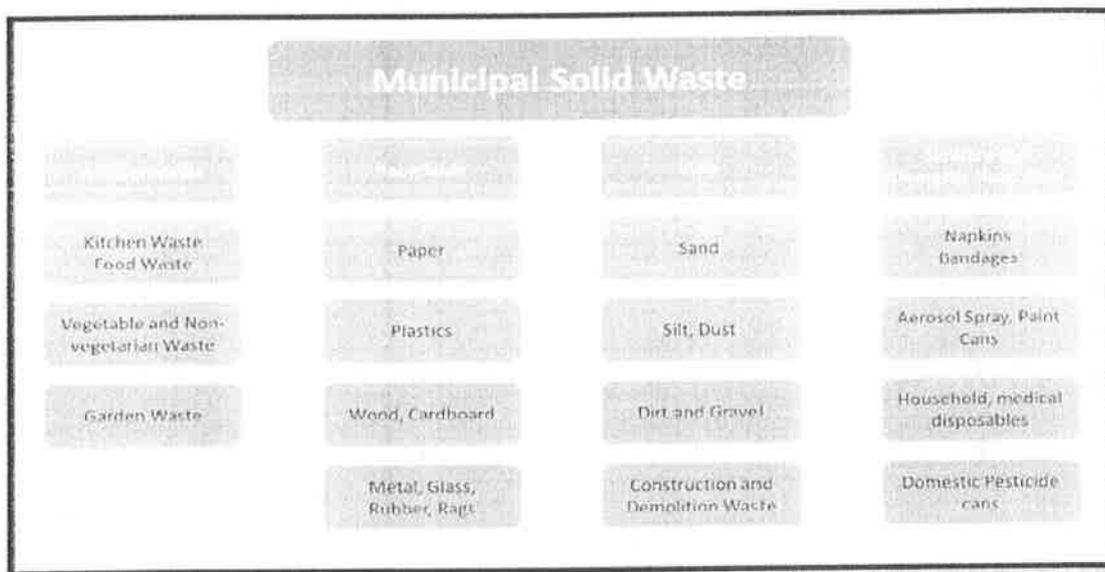


Annexure -1

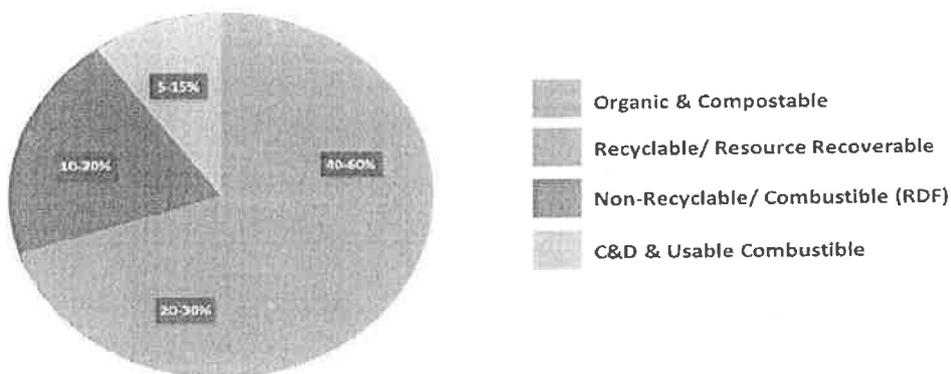
Note on RDF management

Refused Derived Fuel”(RDF) means fuel derived from combustible waste fraction of solid waste like plastic, wood, pulp or organic waste, other than chlorinated materials, in the form of pellets or fluff produced by drying, shredding, dehydrating and compacting of solid waste;

Broad categorization of MSW



Typical Composition of Municipal Solid Waste



1. As per the SWM Rules, 2016 "Materials Recovery Facility" (MRF) means a facility where non-compostable solid waste can be temporarily stored by the local body or any person or agency authorized by any of them to facilitate segregation, sorting and recovery of recyclables from various components of waste by authorized informal sector of waste pickers, informal recyclers or any other work force engaged by the local body for the purpose before the waste is delivered or taken up for its processing or disposal
2. As per the SWM Rules 2016, it is the duty and responsibility of the ULB to setup material recovery facilities (MRFs) or secondary storage facilities with sufficient space for sorting of recyclable materials to enable informal or authorized waste pickers and waste collectors to separate recyclables from the waste and provide easy access to waste pickers and recyclers for collection of segregated recyclable waste such as paper, plastic, metal, glass, textile from the source of generation or from material recovery facilities (MRFs).
3. MRF accepts waste materials, whether source segregated or mixed, and further separates, processes and stores them for later use as raw materials for remanufacturing, reusing and reprocessing. The waste material is basically segregated into different streams of waste fractions (paper, plastic, packaging paper, bottles etc.) which is sold to intermediaries who supply bulk material to the recycling industries. MRFs require medium to large storage spaces depending on their capacity to temporarily store sorted recyclables which can be made available to recyclers in bulk at higher resale value.
4. Recycling prevents a significant fraction of municipal, institutional and bulk waste from being dumped or disposed in landfills. It results in the availability of scarce resources as well as reducing environmental impacts and the burden of waste management on public authorities.
5. MRFs can be further categorized in terms of the type of operations / technology employed
  - Manual - This type of MRFs are suitable for small quantities of MSW like 5-10 TPD only
  - Semiautomatic MRF- This type of Material Recovery Facilities has combination of manual and mechanized operations. Semi-automated MRF can cater for 10- 100/200 plus TPD of segregated waste
  - Mechanical / Automated MRF- Mechanized material recovery facilities are fully mechanized/ automated facilities for material recovery in large quantities (>100 TPD) with least human intervention

6. Pictorial presentation of type of MRF

Manual MRF	Semi-automatic MRF	Mechanical/ Automatic MRF
Weighbridge/ Weighing Scale	Weighbridge/ Weighing Scale	Weighbridge/ Weighing Scale
Manual Loading	Loaders- Manual/Mechanical	Mechanical Loader
Sorting Table/ Sorting platform	Sorting Table/ Sorting Platform	Sorting Table
	Conveyor System	Conveyor System
	Trommel	Trommel
	Magnetic Separator (Optional)	Magnetic Separator
	Baler (Optional)	Air Classifier
		Shredder/ Bottle Perforator (Optional)
		Baler (Optional)

Figure: Basic equipment / Necessary processes in different types of MRFs

7. Siting criteria for MRF: Ideally the MRF shall be located close to both the source of the MSW generation and the industries that will use the recycled materials since the minimization of travel distances is important for reducing costs. In order to be located near the residential areas, the facility must be both environmentally and aesthetically acceptable. A buffer space with trees / shrubs will help improve aesthetics and decrease any noise pollution.
- i. MRFs need to be located close to existing roads, but traffic blocks resulting from the movement of waste collection trucks should be considered and avoided.
  - ii. These facilities must be near or within urban areas that generate the inputs to be processed for recyclables.
  - iii. If the development area is zoned, MRFs are preferably located in an industrial zone or close to a sanitary landfill to facilitate efficient movement of waste from various generators and disposal of residual waste.
  - iv. MRFs should be sited, considering the local geographical features, in a safe manner. Flood-prone areas should not be selected
8. The permissions have to be sought from the State Pollution Control Board (SPCB) in the form of consent to establish, consent to operate, etc. Later, an annual report needs to be given to the SPCB / Pollution Control Committee (PCC).

9. Proposed MRF Systems in brief

Population range & Waste Generation	Indicative % of Dry Fraction (incl.)	capacity of	area required	Proposed infrastructure	Per Facility indicative capital investment (excluding cost of land) in INR	Operation Cost
population in the range of 1- 50,000 and waste generation of approximately 15 to 20 tons per day (TPD),	<50%	1-5 TPD each capacity as per requirement of	1500-2500	Manual MRF		Rs. 15-17 lakhs per year includes honorarium/ salary and regular repair, maintenance cost and consumables
ULBs having population in the range of 50001-100,000 and waste generation of approximately 35 to 40 tons per day (TPD), assuming more than 50% of door to door collection and Segregation of waste.	<50%	2-10 TPD each capacity as per requirement of	1500-3000	Manual MRF	15-45 lakhs	Rs.20-23 lakhs per year includes honorarium/ salary and regular repair, maintenance cost and Consumables.
ULBs having population in the range of 1,00,001-5,00,000 and waste generation of approximately 200 tons per day (TPD), assuming more than 50% of door to door collection and Segregation of waste.	50 - 55%	50, 75, 100 TPD	6000-8000sqm	MRF -	4.0- 6.0 Cr	Rs. 60-70 lakhs per year includes honorarium/ salary and regular repair, maintenance cost and Consumables.
ULBs having population in the range of 5,00,001 - 10,00,000 and waste generation of approximately 200-500 tons per day (TPD), assuming more than 50% of door to door collection and Segregation of waste.	50 - 55%	100+	8000-10000	MRF -	5.0-6.0 crores excluding cost of land	Rs. 70-80 lakhs per year includes honorarium/ salary and regular repair maintenance cost and consumables.
ULBs having population in the of 10,00,000+ and waste generation of approximately 500+ tons per day (TPD), assuming more than 75% of door to door collection and Segregation of waste.	55-60%	100/200/300	10000-12000-20000 sqm (2.5-5.0acres)	Semiautomatic / Automated MRF	18-20, 24-26 and 29-31 (for Capital 100,200,300 TPD respectively) crores excluding cost of land	Rs. 65-.80 Lakhs/month includes honorarium/ salary and regular repair, maintenance cost and consumables

## 10. Sound Practices in MRFs

### Do's at MRF

- (a) A regular check on the working, performance and maintenance etc, of the processing machinery shall be done once in a month.
- (b) Indoor air quality and adequate lighting shall be monitored continuously for healthy working environment
- (c) Provision of suitable exhausts/vents/scrubbers, etc.
- (d) Adequate fire protection measures
- (e) All workers covered under social security and insurance scheme's
- (f) Compulsory use of Protection gears
- (g) Good Hygiene and Sanitation practices including safe drinking water
- (h) MRF kept Clean and Tidy
- (i) Ensure Proper Segregation and Low Rejects
- (j) Periodic Meetings of workers for drills, training
- (k) Keeping detailed logbook of MRF
- (l) Good housekeeping and cleaning all machinery after use
- (m) First Aid

### Dont's at MRF

- (a) No Inflammable objects in premise
- (b) No Smoking
- (c) No Child Labor
- (d) Pregnant women to avoid operating machinery
- (e) Avoid Water and Electricity Wastage
- (f) No Discrimination
- (g) No Littering
- (h) No animals allowed
- (i) Do not Burn Waste
- (j) No explosives or firearms in MRF
- (k) Keep hands away from moving parts of machinery
- (l) Do not wear loose clothing around machinery
- (m) Avoid long term storage of RDF

11. The process of collection, segregation, transportation and recycling involves exposure to contaminants and hazardous waste: It is mandatory to provide a safe working environment for staff, working personnel and any other occupants or visitor at the MRF.

### a) Proposed Hygiene Practices

- Keep the MRF dry & clean always

- Keep sorting & storage area dry and free from pest & flies
- Regularly spray disinfection liquid as better prevention practices
- All working personnel and any other occupant at the MRF must use reusable safety gloves, boots and mask. It is advisable to wear uniform while working.
- Use disposable mask & gloves for visitors.
- Make provision for hand wash and disinfectant, hands must be washed with soap before eating/ leaving the MRF.
- Monthly cleaning & Pest-Control Treatment routine has to be fixed within the MRF and should be followed without ignorance.

#### b) First aid Box

This is only for designing a basic first aid kit and its components and should not be taken as a first aid procedure or training. It is important to have a well-stocked first aid kit at the MRF to deal with minor accidents and injuries. The first aid kit should be kept in a cool and dry place out of the reach of children.

*Basic first aid kit should contain:*

- Emergency telephone numbers for emergency medical services  
1092/102/108
- Bandages in a variety of different sizes and shapes
- Small, medium and large sterile gauze dressings
- A box of adhesive bandages
- Crêpe rolled bandages
- Safety pins
- Disposable sterile gloves
- Tweezers, scissors
- Micro-porous, sticky tape
- Thermometer (preferably digital)
- Cream or spray to relieve insect bites and stings
- Antiseptic cream
- Directions for requesting emergency assistance

b) MRF Shed should be constructed with the stipulated structural stability and always keep out rain & The MRF should be certified by a structural engineer/local ULB engineer and the fire department as per rules.

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- (ii) Characteristics of dry waste including quantities of flexible and rigid plastics coming into the MRF
- (iii) Land available for the MRF including size and shape of the plot available for MRF
- (iv) Access roads to the MRF
- (v) Market conditions and end destinations for different dry waste streams

The following equipment are considered typical for efficient waste handling at an MRF which has a capacity to handle 15 MT for dry waste per day:

Category	Item	Indicative costs (INR)	Comments
Infra - Shop floor (17000 square feet)	Shed + Toilets	2,55,00,000	At Rs.1,500 per sq ft Semi concrete/PEB structure (costing as per December 2020). There can be fluctuations in this rate based on the market conditions and will need to be assessed by each ULB.
	Ventilation System - Turbo/Ridge		
	Mezzanine flooring		
	Rain water harvesting		
	Office + Lunch+ Meeting Room		
	Industrial fans & LED lights		
	Generator room		
Infra - Office and monitoring devices	Table, Chairs & Filing Cabinets	2,00,000	For office work. Please customise as per actual need
	PC, UPS and Printers for office		
	CCTV Camera	2,00,000	Live feed/monitoring of activities at the MRF
	Biometrics	20,000	Attendance monitoring for staff
	GPS	10,000	To be purchased if MRF has its own vehicle
Processing Equipment	Incline conveyor + 2 sorting conveyor of 60 ft length on the mezzanine floor.	20,00,000	The length and number of the conveyor belt depends on the size of the MRF and the type of incoming waste. Each ULB must evaluate this before finalising the conveyor system.
	Flat conveyor (35 ft conveyor belt on shop floor)	4,50,000	The length and number of the conveyor belt depends on the size of the MRF and the type of incoming waste. Each ULB must evaluate this before finalising the conveyor system.
	Weighbridge (electronic, 60 MT capacity)	10,50,000	Weighing of incoming and outgoing waste
	Weighing scale of 300 kg capacity (2 no's)	50,000	Weighing of waste in the MRF.
	Diesel Generator (10 KVA, Backup power supply)	3,00,000	

Category	Item	Indicative costs (INR)	Comments
	Horizontal baler (15 MT capacity)	20,00,000	
	Plastic shredder (250 kg/hr Capacity)	30,00,000	<b>Optional.</b> This should be procured if the MRF is receiving large quantities of rigid plastics.
	Trommel	~14,00,000 <sup>2</sup>	<b>Optional.</b> This should be procured if the facility is receiving mixed waste i.e., wet waste mixed with dry waste.
	Air Density separator	3,50,000	<b>Optional.</b> This should be procured if the MRF is receiving large quantities of flexible/lightweight plastic.
	Magnetic Separator	3,00,000	<b>Optional.</b> This can be used to separate the metal pieces from the waste.
	Single box vertical baler	7,00,000	<b>Optional.</b> This should be assessed on the basis of incoming waste and thereafter, purchased.
Material Handling Equipment	Pallet trucks (2 No's)	60,000	Manual movement of bales
	Semi Electric Stacker of 1000 Kg lift capacity (2 nos.)	2,50,000	
	Bins (20 No's of 1100 ltr capacity)	7,00,000	Storage of sorted waste
	Metal Pallets (20 No's)	1,50,000	Storage of bales
	Mono rail crane	10,00,000	<b>Optional.</b> For loading bales into vehicles
	Skid steer with grab	35,00,000	<b>Optional.</b> For loading waste into hopper with grapple
	Bin lifter	4,00,000	<b>Optional.</b> For loading the waste from bin to baler
Occupational Safety	Fire Extinguishers	2,00,000	Fire safety equipment and training to staff
	Safety helmets with storage rack	15,000	For occupational safety of field staff during loading of waste.
	Barricade cones & signage boards	50,000	Safety at the MRF along with appropriate signage.
	Truck Life Lines	2,00,000	<b>Optional.</b> Overhead fall protection system while loading
	PPE and Uniforms	1,50,000	Occupational safety for the MRF staff.
Statutory	Factories Act Registration and other labour and environmental compliance.	50,000	Application process under various labour and environmental regulations.

<sup>2</sup> This price will depend on capacity and screening size of particles.

Category	Item	Indicative costs (INR)	Comments
Other requirements	Scrubber & Sweeper	1,65,000	Ensuring clean and hygienic working conditions
	Housekeeping equipment	1,00,000	Lockers, water purifiers, utensils, etc.
<b>Contingency costs</b>			3% of total costs considered to compensate the price fluctuation

## 2.2. NORMATIVE STANDARDS FOR MANPOWER

The manpower should be deployed as per the incoming waste into the MRF. Initially the number of staff should be according to the minimum requirement during the ramp up phase due to less waste coming into the facility and thereafter, it should be proportionately increased along with the capacity of the plant. Please also note that the below is only an indication and to be used for reference. The operating manpower of a facility will have to be customised as per specific requirements.

- (i) **Sorting staff:** The typical sorting efficiency for one person per shift of 8 hours is 120-150 Kg where sorting is carried out for 15-25 categories depending on the waste characterization and raw material requirements from the recycling partners. On this basis, for a mezzanine floor conveyor of 50-60 ft, minimum 8 sorting staffs and one feeder is required. For floor conveyor of 35 ft, minimum 6 sorting staffs and one feeder is required. This also depends heavily on the type of material being sorted.
- (ii) **Trommel Operators:** Minimum two staff per shift of 8 hours will be needed to feed the dry waste into trommel.
- (iii) **Baling staff:** For horizontal baler, a minimum of three people are needed to operate the machine. For a single box vertical baling machine, a minimum of 2 and an ideal 3 staff are required depending on the type of material being baled. And for a twin box vertical baling machine 4 staff will be required. Please note, the above is not considering stacking of the bales after the baling process.
- (iv) **Loader and Unloaders:** Four workers have been planned for loading and unloading of waste typically working during the general shift overlapping the day and the night shift (in the case of operations across 2 shifts per day).
- (v) **Security:** One security per shift is required to keep a watch on all inward and outward material flows, persons entry, register book maintenance, etc.
- (vi) **Housekeeping:** One for each shift, to clear the spillages during material movements and to keep the office, restroom areas clean.
- (vii) **Factory Manager:** One factory manager to manage both the shifts on daily operations.
- (viii) **Accounting + Admin:** An accountant to capture the day to day to quantification and also to look after the office related works, following up on the payments and workers salary.
- (ix) **Line man:** To manage all the shop floor activities in the MRF, 1 for each shift.

## 2.3. TYPICAL PROCESS AT AN MRF

The source segregated dry waste is received at the MRF where it is temporarily stored at the unloading area. The dry waste can then be fed into the conveyor system using a hopper. If there is contamination in the waste (i.e. presence of wet waste), it needs to be run through the

trommel system to separate the wet and the dry waste. On the conveyor system, dry waste can be sorted into more than 25 categories where lighter material with greater volume such as plastic flexibles, tissues, multi-layered packaging etc. should be sorted and aggregated in an area below the conveyor system while heavier materials such as PET and/or HDPE items can be stored in bags or bins next to the sorting staff. This further sorting of dry waste results in better resource recovery and therefore, increases the value from dry waste.

The sorted dry waste is stored separately in a temporary storage location and thereafter, fed in to the baler or shredder. Depending on the type, the waste can either be baled or shredded. Baling of dry waste results in efficiency in transportation given the optimisation of space while shredding of certain types of plastic in accordance with type and colour increases its economic value.

The recyclable dry waste streams should be sent to appropriate recycling facilities, the non-recyclable waste having a high calorific value (i.e. above 1500 cal/kg) is sent to cement kilns for co-processing and/or incineration facility and the rejects are sent to sanitary landfills.

This process flowchart is explained in further detail in **Annexure I**.





## Advisory on On-Site and Decentralized Composting of Municipal Organic Waste

### Speeding up Composting – Alternative Sources of Culture/Biocolum/Inoculum

Most of the microorganisms for composting are readily Available in the MSW it and they tend to multiply rapidly in favorable conditions. Further, the number of bacteria is rarely a limiting factor in composting, provided all other (above mentioned) factors are appropriate. However, there are various inoculums available in the market claiming to hasten the composting process. Following are some of the locally available materials which can be used as alternatives to the commercially patented inoculums.

#### a) Cow dung:

Fresh cow dung may be used as alternative for patented inoculum/biocolum/culture. The ratio of mixing varies with the characteristics of the waste material to be treated. Cow dung added in excess to the waste will not affect the quality of the compost. However, care is to be taken to maintain the moisture content of the overall mixture at 45% to 55% by weight, for aerobic digestion.

In some cases, additives such as Urea/DAP are added to the waste cow dung mixture to maintain the C/N ratio. For 1000 kg microbial enriched compost production, the quantity of fresh waste material, cow dung and urea required will be 1600, 320 and 21 kg, respectively.

In anaerobic digestion, the cow dung will be added in slurry form for initial seeding. The slurry can be made by mixing fresh cow dung with water in the ratio of 1:1. Sometimes other additives like jaggery, yeast etc. will be added to the slurry, based on the requirement.

#### b) Sour Buttermilk/Curd:

Sour buttermilk/curd can be used to accelerate the aerobic composting. The ratio of sour buttermilk/curd to that of the waste varies with the characteristics and quantity of the waste material to be treated. Care is to be taken to maintain the moisture content of the overall Mixture at 45% to 55% by weight, for aerobic digestion. thermophilic and mesophilic bacteria. Since IARI makes

#### c) Sludge of Sewage Treatment Plants (STPs) and digesters:

The sludge of the STPs and digesters can be used as source of microorganisms in aerobic/anaerobic composting processes. However, it may be noted that the sludge from the STPs which uses aerobic treatment processes will be useful only for aerobic composting process and the sludge of the digester will be only useful for seeding the anaerobic processes. Care may be taken to maintain the moisture content of the overall mixture at 45% to 55% by weight, for aerobic digestion.

#### d) Panchagavya

Panchagavya, an organic concoction has the potential to promote growth and providing immunity in plant systems. Panchagavya consists of nine ingredients viz. cow dung, cow urine, milk, curd, jaggery, ghee, banana, Tender coconut and water.

Mix 7 kg Cow dung and 1 kg Cow ghee thoroughly both in morning and evening hours and keep it for 3 days. After 3 days, mix 10 L of cow urine & 10 L of water with the mixture and keep it for the next 15 days with regular mixing both in morning and evening. After 15 days, mix the following and panchagavya will be ready after another 30 days.

- Cow milk - 3 litres
- Cow curd - 2 litres
- Tender coconut water - 3 litres
- Jaggery - 3 kg
- Well ripened banana – 12 nos.

#### e) Compost Inoculant developed by Indian Agricultural Research Institute (IARI), New Delhi-110012 (popularly called PUSA Institute)

IARI, Pusa Road, New Delhi has developed an inoculum of consortium of microbes (extracted from cow dung) to accelerate the process of composting. This microbial consortium made in the labs at Pusa has a mix of basis. The course is in lecture-cum-practical format

## Advisory on On-Site and Decentralized Composting of Municipal Organic Waste

it only for demonstration purposes, a sample can be obtained by request to the division of Microbiology. This consortium can be used for small scale composting only. IARI also states that same microbes are present in air hence waste decomposition can happen even without the inoculum.

On the other hand, there are several Composting inoculants available at varying prices in the market making many claims. Users are unsure of claims made by the inoculant vendors. IARI at Pusa can carry out scientific experiments for comparative performances of inoculants available in the market, with IARI inoculate as a baseline. The lab in Pusa also has facilities to carry out quality testing of city compost as per FCO norms.

### *IARI Training on Composting at Pusa Institute*

Dr. S.D. Mishra and his team at IARI provide entrepreneurs interested in composting with the technical knowhow to run a business. This technical know-how is disseminated through a 3-5 day training programme run on fee

covering the production and utilization of different kinds of compost (vermicomposting, windrows, machine composting, microbial culture for composting, etc.) along with best practices such as Terrace Gardening, Kitchen Gardening, management of Park, Institutional, Mandi and Household Waste, Tips for Segregation, Different models of composting customized for different income segments, etc.

### *Contact Details:*

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### **1.1 Compost Quality Standards**

Compost Quality Standards as per Solid Waste Management Rules, 2016; Fertiliser Control Order, 2009; and Fertiliser Control Order, 2013

Sl. No.	Parametres				Organic Compost FCO 2009	Phosphate Rich Organic Manure FCO (PROM) 2013
1.	Arsenic (mg/kg)				10.00	10.00
2.	Cadmium (mg/kg)				5.00	5.00
3.	Chromium (mg/kg)				50.00	50.00
4.	Copper (mg/kg)				300.00	300.00
5.	Lead (mg/kg)				100.00	100.00
6.	Mercury (mg/kg)				0.15	0.15
7.	Nickel (mg/kg)				50.00	50.00
8.	Zinc (mg/kg)				1000.00	1000.00
9.	C/N ratio				<20	less than 20:1
10.	pH				6.5 - 7.5	(1:5 solution) maximum 6.7
11.	Moisture, % by weight, maximum				15.0-25.0	25.0
12.	Bulk density (g/cm <sup>3</sup> )				<1.0	Less than 1.6
13.	Total organic carbon, % minimum	by	weight,	12.0	7.9	
14.	Total nitrogen (N), % by weight, minimum				0.8	0.4

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15.	Total phosphate (P <sub>2</sub> O <sub>5</sub> ), % by weight, minimum	0.4	10.4
16.	Total potassium (K <sub>2</sub> O), % by weight, minimum	0.4	-
17.	Colour	Dark brown to black	-
18.	Odour	Absence of foul odour	-
19.	Particle size	Minimum 90% material should pass through 4.0 mm IS sieve	Minimum 90% material should passthrough 4.0 mm IS sieve
20.	Conductivity (as dsm-1), not more than	4.0	8.2

Note: Tolerance limits as per FCO:

For compost- A sum total of nitrogen, phosphorus and potassium nutrients shall not be less than 1.5% in compost  
For PROM- No such directive

### Vermi-Compost Standards as per Fertilizer Control Order, 2009

Sl. No	Criteria	Value
1.	Moisture % by weight	15.0-25.0
2.	Colour	Dark brown to black
3.	Odour	Absence of foul odour
4.	Particle size	Minimum 90% material should pass through 4.0 mm IS sieve
5.	Bulk density	0.7-0.9
6.	Total organic carbon, % by weight, minimum	18.0
7.	Total nitrogen (N), % by weight, minimum	1.0
8.	Total phosphates (P <sub>2</sub> O <sub>5</sub> ), % by weight, minimum	0.8
9.	Total potash (K <sub>2</sub> O), % by weight, minimum	0.8
10.	Heavy metal content (mg/kg) by weight, maximum	
	a. Cadmium (Cd)	5.00
	b. Chromium (Cr)	50.0
	c. Nickel (Ni)	50.0
	d. Lead (Pb)	100.0

Note: Tolerance Limit for vermicompost:

The sum total of Nitrogen, Phosphorus and Potassium nutrients should not be less than 2.5 % in the case of vermicompost.

## Advisory on On-Site and Decentralized Composting of Municipal Organic Waste

### About the Advisory

Solid Waste Management Rules 2016 published by Ministry of Environment, Forest & Climate Change, lay emphasis on decentralised waste management. Therefore, to create awareness of decentralised waste treatment systems and to generate competitive waste management among the cities under Swachh Bharat Mission (SBM), greater stress is being laid on the installation of decentralised treatment facilities and distinct scoring marks have been allocated towards the same in Swachh Survekshan 2018 and in future also.

With this in view, this advisory is being published by the Ministry to throw light on several onsite and decentralised organic treatment methods and units currently being used. The decentralised treatment processes have been classified into four categories based on the number of households while considering organic waste generation as 100-200 gm/capita/day, out of the total waste generation of about 400-450 gm/capita/day.

The waste to compost systems have been categorized as in the table below depending upon their capacity of treatment:-

### Advantages of Decentralised Composting

1. Reduction in the collection and transportation chain of MSWM and costs thereof.
2. Reduction in GHG emissions due to uncontrolled putrefaction /decay of biodegradable waste due to extended collection and transportation chains.
3. Reduction in smell/bad odour at the premises / storage points and roads & streets.
4. Elimination of uncontrolled leachate.
5. Shorter the collection & transport chain, better the quality of City compost.
6. Decentralised City compost producers are more likely to use the compost themselves or develop strong off-take arrangements.

### Suitability of Method/Technology of composting for the quantity of Organic Waste Generated

The table on next page gives the gist of suitability of various onsite and decentralised composting methods discussed in this advisory, for various sizes of households and other premises/establishments. However, any methods for handling smaller capacity of waste can be used to handle more waste simply by increasing the number of units. In such cases, it is recommended to work out the cost comparisons and space requirements before selecting an appropriate method according to the need and financial capacity.

Sl. No.	Category	No. of Households	Suitability
1.	Category – 1	Up to 10 Households	Individual Households, small Communities, Apartments etc.
2.	Category – 2	11 – 300 Households	Medium sized Communities, Apartments, RWAs, medium sized Offices, medium Hotels, Resorts, medium Schools, Canteens, Marriage Halls
3.	Category – 3	301 – 1000 Households	Large Communities, Apartments, RWAs, high-rise buildings, large Offices, large Hotels, large Schools
4.	Category – 4	Above 1000 Households	Decentralized Composting plants operated by ULBs/Institution/ Outsourced agency

The subsequent pages of this advisory provide details on some of the onsite and decentralised organic waste treatment methods. This can be used as a ready reference by various stakeholders for managing their solid waste at source itself and in decentralised manner.

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S.No	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	Decentralised Plants for above 1000 households operated by ULBs / Institution / Outsourced Agencies
1	Pit Composting	✓	x	x	x
2	Pot Composting	✓	x	x	x
3	Tri Pot Composting	✓	x	x	x
4	B.o Composter	✓	x	x	x
5	Ring Composting	✓	x	x	x
6	Kitchen Bin Composting	✓	x	x	x
7	Mose Pit Composting	✓	x	x	x
8	Blue HDPE Digester	✓	x	x	x
9	Ecopot	✓	x	x	x
10	Drum Composting System	✓	✓	x	x
11	Rotary drum composting (Small)	✓	x	x	x
12	Composting Basket/Bin	✓	x	x	x
13	Vermi Composting	x	✓	x	x
14	Portable Household Bio Bin	x	✓	x	x
15	Aerobic Bin Composting	x	✓	x	x
16	Centralised Masonry Biotank Composting	x	✓	x	x
17	Organic Waste Composting Machine	x	✓	✓	x
18	Byobin	x	✓	x	x
19	Orbin	x	✓	x	x
20	Solar Composter	x	✓	x	x
21	Aaga	x	✓	x	x
22	Bokashi	x	✓	x	x
23	Plastic crates	x	✓	x	x

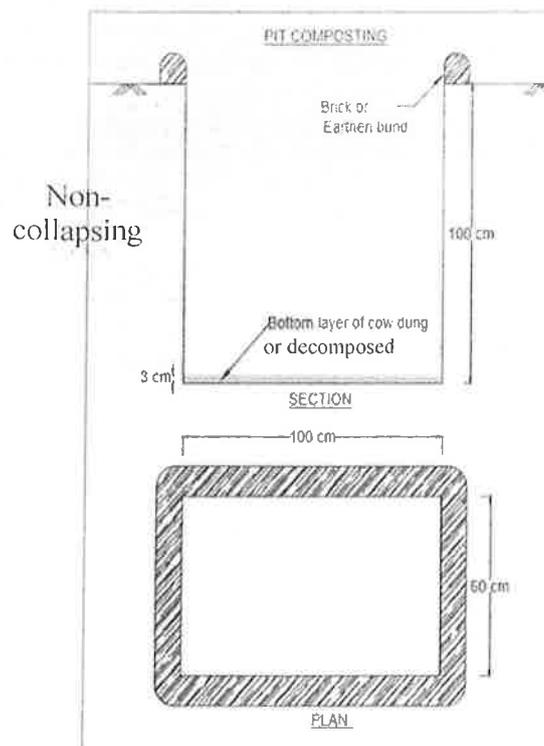
## Advisory on On-Site and Decentralized Composting of Municipal Organic Waste

S.No	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	Decentralised Plants for above 1000 households operated by ULBs / Institution / Outsourced Agencies
24	Steel Mesh Composter	x	✓	x	x
25	FRP Aerobic Digester	x	✓	x	x
26	Wet Waste Composter	x	✓	x	x
27	Marigold	x	x	✓	x
28	Soil and Health SWM consultant aerobic and anaerobic composter	x	x	✓	x
29	Large Scale Composting Pits	x	x	✓	x
30	Windrow Composting	x	x	x	✓
31	Rotary Drum composting (Large)	x	x	x	✓
32	Vermi Composter	x	x	x	✓
33	Tallboy	x	x	x	✓
34	Temple Flowers Waste Recycling to Agarbatti Making				

## Advisory on On-Site and Decentralized Composting of Municipal Organic Waste

### 1. Pit Composting

SI No	Description
1	<p><u>Specification and Size</u></p> <ul style="list-style-type: none"> <li>• Pits of adequate size to bury bio-degradable waste continuously for about 6 months in each pit.</li> <li>• Pit size of length of 1m and width 60 cm and depth 1m for a family of 5 or 6 members. Bigger size pits for bigger families according to requirements.</li> </ul>
2	<p><u>Infrastructure Requirements</u></p> <ul style="list-style-type: none"> <li>• Two pits of adequate size to be dug.</li> <li>• Tarpaulin or PVC roofing sheets to cover the pits.</li> <li>• Cow-dung, loose earth.</li> <li>• Tools like shovel, hoe etc.</li> </ul>
3	<p><u>Operation &amp; Maintenance</u></p> <ul style="list-style-type: none"> <li>• Choose an elevated area where water does not get collected. Otherwise make necessary provisions to prevent entry of water into the pit by constructing a small bund around the pits.</li> <li>• Spread a layer of cow dung slurry or decomposed waste at the bottom of the pit before filling the waste for composting.</li> <li>• Spread the waste over the cow dung or decomposed waste layer.</li> <li>• Waste of bigger sizes are to be cut into small pieces for easy decomposing.</li> <li>• A thin layer of earth may be sprinkled over the waste daily to avoid bad smell from the pit.</li> <li>• Repeat the procedure daily while depositing more waste.</li> <li>• Once the pit is filled, close the pit by spreading a layer of 15cm of earth.</li> <li>• Once the first pit is closed, use the other pit in the same way.</li> <li>• The waste in the first pit becomes compost after a period of 4 to 6 months, empty the pit and make it ready for use. The compost can be used either as manure or sold or disposed-off in suitable manner.</li> <li>• Protect the pit from rain water. Keep it covered by means of tarpaulin or PVC roofing sheet during rains.</li> </ul>



## Advisory on On-Site and Decentralized Composting of Municipal Organic Waste

### Section and Plan of Pit for Composting

#### 10. Drum Composting

Provider	Muskan Jyoti Samiti
Capacity	For individual house - 2 Drums of 50 L capacity each For 15 families – 3 drums of 200 L capacity each
Ideal Community Size	Most suitable for individual households, temples, vegetable & fruit markets, small, medium & big colonies, apartments etc.
Add-on Supplies	None
Infrastructure	Space for keeping the drums
Processing Time	15-25 days
Investment Cost	Rs. 1500/drum
Running Cost	Rs. 50/250 ml culture which is sufficient for treating 80-100 kg of waste.
Operation & maintenance	<ul style="list-style-type: none"><li>• Take a plastic drum of 200 litres capacity (for individual house 2 drums of 50 litres)</li><li>• A tap is fitted at the bottom of tank for the collection of leachate.</li><li>• Place the drum on a base of adequate height, so that a 5 L jar/plastic container can be kept below it, under the tap.</li><li>• Prepare the liquid culture by mixing adequate amount of culture in water. For treating 80-100 kg of waste mix 250 ml of culture in 3 litres of water (i.e. final mix will be 3.25 L)</li><li>• Collect the segregated waste in plastic net bag of 25 kg capacity and tie a knot by plastic rope of 15 cm when it gets filled.</li><li>• Keep the plastic net bags in the drum</li><li>• Mix the segregated waste with the culture solution inside the drum by wearing gloves.</li><li>• After mixing, put some bricks/ peedha inside the drum in such a way that the bags carrying the waste do not block the tap.</li><li>• Continue the above processes until the drum gets filled.</li><li>• Pour the remaining leftover solution of the container into the drum from the top and close the lid of the drum.</li><li>• Place a 5 L jar/plastic can below the tap.</li><li>• Keep the tap open and collect all the leachate coming out of the tap.</li><li>• Till third day, pour back the liquid collected into the drum.</li><li>• Open the drum on the third day, observe whether degradation is uniform or not.</li><li>• If not uniform, then add more liquid solution to it by mixing 250ml culture with 3 litres of water for 80-100 kg of waste.</li><li>• Whenever process starts to smell then add some more culture (mixed with water) to it.</li><li>• On the 22nd day, take out all the net bags from the drum and spread the contents of the net bag on the ground to dry.</li><li>• After drying the solid waste for 2 days, sieve it and thus the compost is ready.</li><li>• The liquid left inside the drum is also a manure, so collect it and use it after proper dilution.</li></ul>
Contact	Mr. Meva Lal, Chaudhary Purwa, Old Kechwa Farm, Madiyawa Village, Kursi Road, Lucknow-226021, Mob. 9415410043, e-mail: muskanjyoti1994@gmail.com, Website: <a href="http://www.muskanjyoti.org">http://www.muskanjyoti.org</a>

## Advisory on On-Site and Decentralized Composting of Municipal Organic Waste

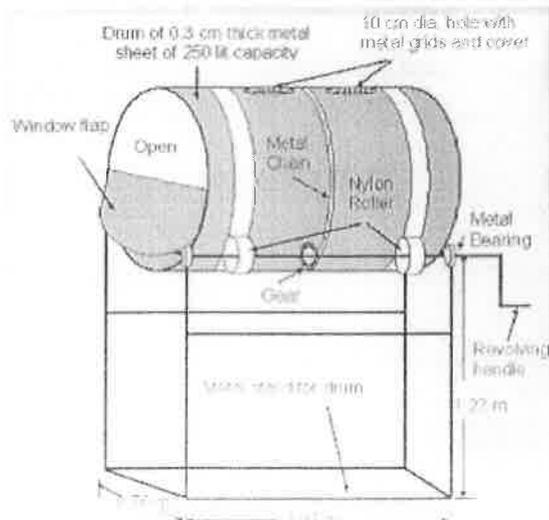


**Drum Composting**

### 11. Rotary drum composting (Small)

Method	Aerobic
Processing Time	15-20
Capacity	A batch Rotary drum of 250 L capacity is used for batch composting of household organic waste
Machine Description	<ul style="list-style-type: none"> <li>• The inner side of the drum is covered with anti-corrosive coating.</li> <li>• The drum is mounted on four rubber rollers and attached to metal stand.</li> <li>• The drum is rotated manually.</li> <li>• In order to provide the appropriate mixing of wastes, 40mm long angles are welded longitudinally inside the drum.</li> <li>• In addition, two adjacent holes are made on top of the drum to drain excess water.</li> </ul>
Operation & Maintenance	<ul style="list-style-type: none"> <li>• Waste mixture is shredded to 1 cm in order to provide better aeration and moisture control.</li> <li>• Once a day clockwise turning was carried out manually by handle, which ensures proper mixing and aeration.</li> <li>• Thereafter, aerobic condition is maintained by opening half side doors.</li> <li>• Two to three rotations at a time are made to ensure that the material on the top portion moved to the central portion, where it is subjected to higher temperature.</li> <li>• Primary stabilized compost is achieved within 15-20 days.</li> </ul>

## Advisory on On-Site and Decentralized Composting of Municipal Organic Waste



### USER'S FEEDBACK

Name of the unit: Rotary drum composting (Small) Place of the installation: Sector - 9, R.K.Puram, Delhi Coverage: 10 Households

Capacity: 200 L

Year of commissioning: 2017 Cost of unit: Rs. 5,000/unit

Biodegradable waste treated per day: 5-10 kg approx.

Compost production per day: 1-2 kg approx.

Processing time: 60 days

Usage of manure: Given to the local residents & schools at free of cost and used in parks/gardens O & M cost: Nil

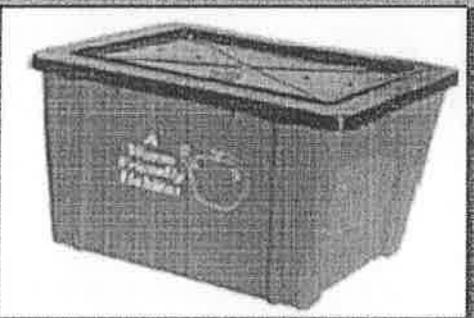
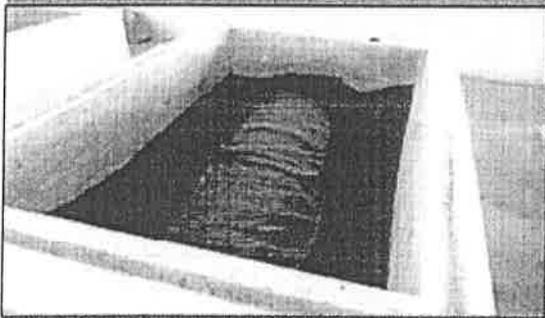
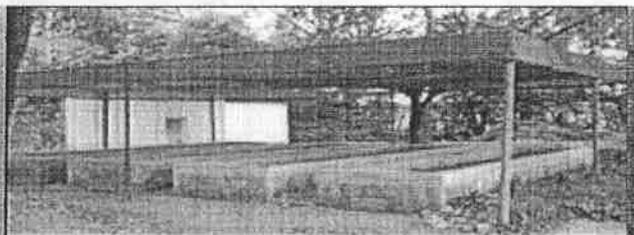
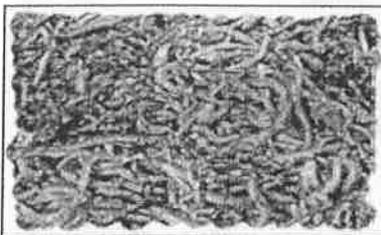
Do's & Don'ts: Chop the waste for speedy composting, materials like coconut shells and like-wise are to be avoided.

Contact details of the user: Mr. Sailesh Kumar, Executive Engineer (EMS), South Delhi Municipal Corporation, e-mail: eeemssouthzone@gmail.com

## Advisory on On-Site and Decentralized Composting of Municipal Organic Waste

### 1. Vermi Composting

SI No	Description	Unit Cost
1	<p>Specification and Size – Anyone below:</p> <p>a) Two numbers of broad mouth PVC basins of 25 litre capacity each or one PVC basin of 50 litre capacity with a partition at the centre, minimum weight of the combined unit be 2.5kg or</p> <p>b) Two numbers of broad mouth fibre basin 25 litre capacity each or one fibre basin of 50 litre capacity with a partition at the centre (minimum thickness of the fibre body 3mm) or</p> <p>c) Mud pots country burnt two numbers capacity 25 litres each or</p> <p>d) Terracotta jars with lids two numbers, 25 litre capacity each</p>	<p>Rs.1200/-</p> <p>Rs.1400/-</p> <p>Rs.950/-</p> <p>Rs.980/-</p>
2	<p>Infrastructure Requirements</p> <ul style="list-style-type: none"> <li>• Base layer with coconut fibre/gravel/sand with cow-dung (5kg) powder.</li> <li>• Wire-mesh lid covers.</li> <li>• 200 earthworms in each tank.</li> <li>• Holes at the bottom of the basin/pot/tank to drain leachate/vermi wash to a vessel if kept below.</li> <li>• Arrangements for protecting the basin/pot/tank from rats, ants, etc.</li> <li>• Thick wet cloth or wet sack piece for covering the waste.</li> <li>• Surgical hand gloves for handling waste &amp; manure.</li> <li>• Vermi wash collection system is optional.</li> </ul>	
3	<p>Operation &amp; Maintenance</p> <ul style="list-style-type: none"> <li>• Chop the waste to size less than 5cm before placing in the Basin/ pot/ tank.</li> <li>• Thickness of waste layer should not exceed 15 cm.</li> <li>• Use one basin/ pot/ tank for the first 15 days and then use the second basin/ pot/ tank after filling the first.</li> <li>• Sprinkle cow-dung powder along with waste.</li> <li>• Protect the vermi basins/ pots/ tanks from rats, ants and other pests.</li> <li>• Keep the waste covered with wet sack or cloth.</li> <li>• Sprinkle water over the cover sack/cloth to maintain moisture of 50-55%.</li> <li>• Avoid over sprinkling of water and stagnation of liquid at the bottom of the basin.</li> <li>• Vermi Basin/pot/tank should not be exposed to direct sun light or rainfall.</li> <li>• Prevent introduction of excessive hot, sour and oily substances and also bones, meat &amp; fibre materials.</li> <li>• For removing the vermi compost, expose the basin/pot/tank with contents in shaded sunlight for 2-4 hours and remove the compost from the top and use the basin/pot/tank with earthworms for further composting of bio-wastes.</li> <li>• Compost taken out should not be dried under sunlight.</li> <li>• Renew the base layer annually.</li> <li>• Collect wash out from the basin in the final stages of composting for vermi wash.</li> </ul>	

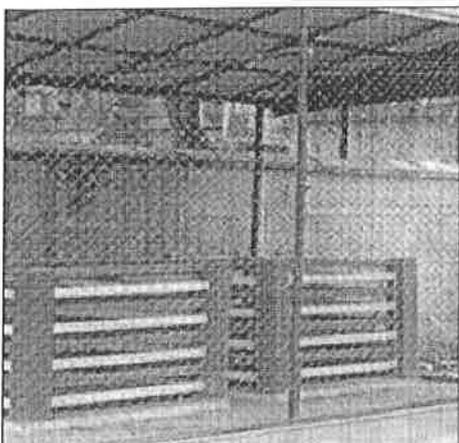
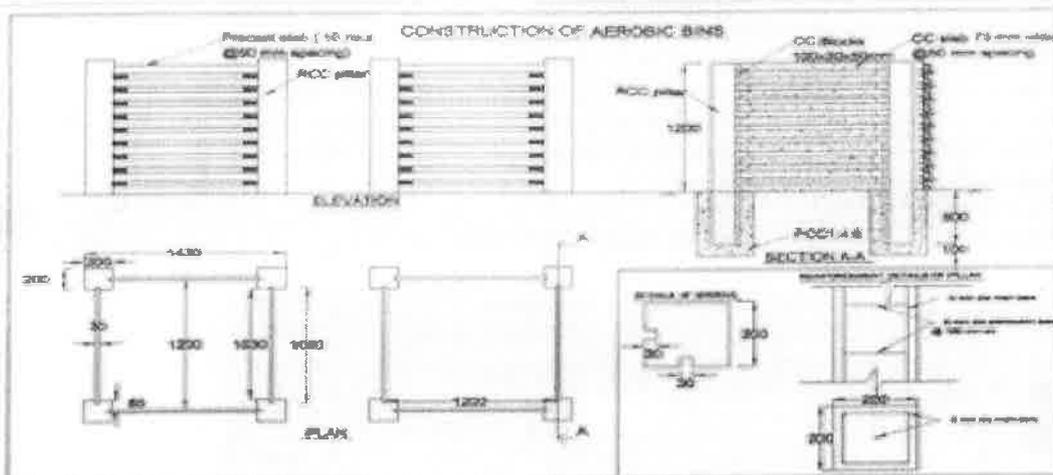


Vermi Composting

## Advisory on On-Site and Decentralized Composting of Municipal Organic Waste

### 2. Aerobic Bin Composting

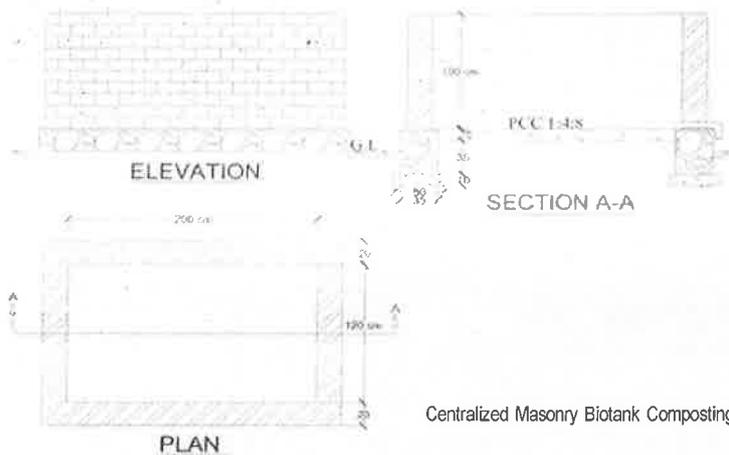
Sl. No.	Description
1.	The composting unit includes a box like structure with Ferro cement floor. Layers of cow dung, carbon source and waste materials are subjected to composting in presence of oxygen. The temperature rises rapidly in the waste to almost 70°C, the peak temperature killing pathogens. An efficient aerobic compost bin does not emit foul ammonia like smell.
2.	<p><b>Technical Aspects</b></p> <p>Aerobic cluster composting unit consists of two units. Each unit is a 120cm x 120cm x 120cm ferro cement bin with airspace and grooves utilizing bacteria consortium from cow dung and carbon source from dry leaves and paper bits with a roof to prevent rain water. 6" layer of fresh cow dung as the first layer with 6" layer of dried leaves provide the carbon source for the bacteria to flourish, above that another six inch layer waste is laid which gets converted into compost.</p> <p>The core temperature built up in this layering is 70 - 75°C which prevents the breeding of flies and parasites. Moreover due to aerobic functioning no putrid smell is present. About 1000kg waste can be managed in a bin. It can give compost with carbon nitrogen ratio 20 - 30% after 90 days.</p>
3.	<p><b>Operation &amp; Maintenance</b></p> <ul style="list-style-type: none"> <li>• A 6 inch layer of fresh cow dung is laid as the first layer.</li> <li>• A 6 inch layer of dried leaves is laid on top of the cow dung layer.</li> <li>• Above that 6 inch layer waste is added and inoculum containing enzymes made from cow dung is sprayed, this hastens composting.</li> <li>• Alternate, 6 inch layers of dried leaves and waste sprayed with inoculum is repeated till the bin is filled.</li> <li>• Once the first bin is filled, start using the second bin. By the time the second bin is filled, the contents in the first bin will turn into compost.</li> </ul>
4.	<p><b>Unit Cost</b></p> <p>A unit with two aerobic bins will cost Rs.41,000. Providing enclosed rain shed with provision for drainage and soak pit for leachate, ramp for trolley etc. will cost Rs 1,40,000/-.</p>



## Advisory on On-Site and Decentralized Composting of Municipal Organic Waste

### 3. Centralised Masonry Biotank Composting

SI No	Description
1	<p><u>Specification and Size</u></p> <ul style="list-style-type: none"><li>• For an apartment of 40 units, at least 2 nos. of tanks each of capacity 2 m × 1.2 m × 1 m (2.40 cu m) are required.</li><li>• It is recommended to build the tank at the central part of the Apartment with RR masonry foundation and a brick wall.</li></ul>
2	<p><u>Infrastructure Requirements</u></p> <ul style="list-style-type: none"><li>• A temporary roofing to be provided for protection from rains.</li><li>• A net to avoid birds/insects attack.</li><li>• A dung mixture comprising of cow dung, Jaggery, condiments, yeast and fibre.</li></ul>
3	<p><u>Operation &amp; Maintenance</u></p> <ul style="list-style-type: none"><li>• Put the bio degradable wastes in the tank.</li><li>• Spray the organic mixture of cow dung, Jaggery, condiments, yeast and fibre above the waste.</li><li>• Once the first tank is full, use the second tank and then the third tank.</li><li>• The leachate from the tank can be collected through a tap provided at the bottom of the tank and can be used as manure for plants or can be drained to Septic tank/Soak pit or sewer.</li><li>• Once the third tank is filled, the compost from tank 1 is emptied and it can be used again and the entire process gets repeated.</li></ul>



## Advisory on On-Site and Decentralized Composting of Municipal Organic Waste

### 4. Organic Waste Composting Machine

SI No	Description
1	<u>Specification and Size</u> <ul style="list-style-type: none"><li>• Certain shredding machines like bio-waste converting machines which can shred 10, 25, 50, 125, 150 Kg of wastes at a time are available in the market.</li></ul>
2	<u>Infrastructure Requirements</u> <ul style="list-style-type: none"><li>• Plastic bags of capacity 20 Kg.</li><li>• Racks for the safe keeping of the bags containing partially processed waste.</li><li>• Room of dimension 3 m × 4 m with proper ventilation for installing machinery and safe storage of racks and baskets is required.</li><li>• An organic solution, power connection of 4 - 10 KW and water connection are required.</li><li>• Investment cost – Rs. 5 Lakh and above, as per the capacity required.</li></ul>
3	<u>Operation &amp; Maintenance</u> <ul style="list-style-type: none"><li>• Mix a little cow dung slurry or any other rapid composting material with suggested quantity of segregated waste.</li><li>• Put this mixture in the machine and run the machine for 15 minutes.</li><li>• Transfer the partially composted shredded waste to basket and store in the rack.</li><li>• The moisture content should not be less than 40%.</li><li>• In 15 days, waste will become compost.</li></ul>
4	<u>Vendors</u> <ol style="list-style-type: none"><li>1. Excel Industries Limited, Mumbai Email:owc@excelind.com, Tel.: +91-22-66464342 Website : <a href="http://www.excelind.co.in/Excel_ENBT/index.html">http://www.excelind.co.in/Excel_ENBT/index.html</a></li><li>2. Vennar, Bengaluru Email: <a href="mailto:vennar10@gmail.com">vennar10@gmail.com</a>   Phone: +91 9844011329 (Narendra Babu) Website: <a href="http://www.Vennar.in">http://www.Vennar.in</a></li></ol>

Organic Waste Composting Machine



## Advisory on On-Site and Decentralized Composting of Municipal Organic Waste

### 5. Byobin

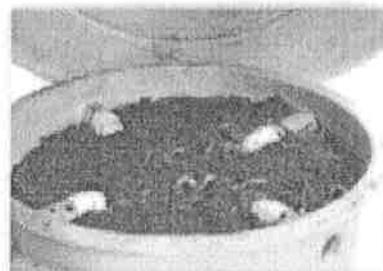
Provider	Pelican Biotech
Method	Aerobic
Capacity	300L to 600L
Ideal Community Size	50-300 households
Add-on Supplies	Inoculum
Infrastructure	Can be kept outside, but rain protection required.
Processing Time	45 days
Investment Cost	Rs. 1000 per household
Running Cost	Rs. 50 per month per HH
Operation & Maintenance	<ul style="list-style-type: none"> <li>• Each Byobin has 300- 600L capacity. It can accommodate maximum 15Kg waste perday.</li> <li>• The bins work in pairs.</li> <li>• In first month 1st bin will be used.</li> <li>• 4-5 inches (~20Kg) of wet waste is sandwiched between 1 inch layer of composorb(inoculum powder) in the 1st bin till the bin is filled up.</li> <li>• A layer of dry leaves over wet waste will reduce maggots and moisture content in thecompost</li> <li>• Once the 1st bin is filled, it is left for composting while the 2nd bin is started.</li> <li>• Compost can be retrieved little by little from the top from the 1st bin after 15 days afterthe last addition to the bins.</li> <li>• The leachate collects in the bottom tank below.</li> <li>• Aerating holes below the net allows cold air to flow in, which provides the required aerobicenvironment for the composting mass.</li> <li>• The net also provides separation between the leach collection tank and digestermaintaining dry compost.</li> </ul>

Contact

Email: [contact@pelicanbiotech.com](mailto:contact@pelicanbiotech.com), [tvvenkat2000@yahoo.com](mailto:tvvenkat2000@yahoo.com)

Phone: +91 7204057502, 9447365542

Website: [www.pelicanbiotech.com](http://www.pelicanbiotech.com)

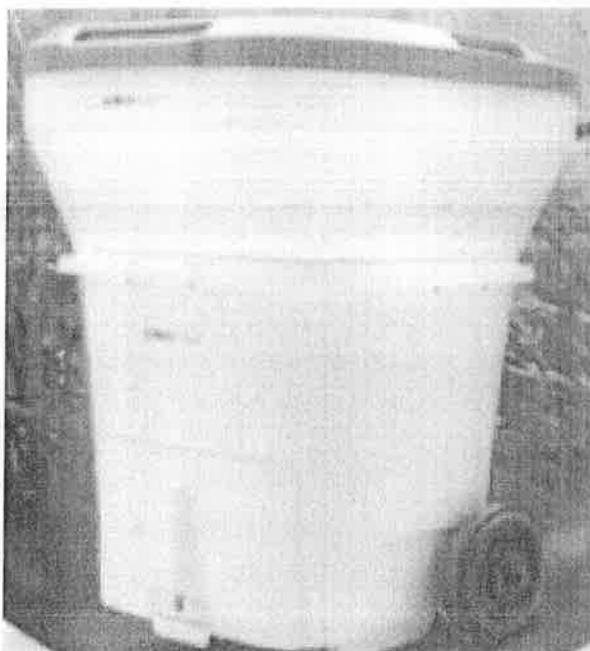


Byobin

## Advisory on On-Site and Decentralized Composting of Municipal Organic Waste

### 6. Orbin

<b>Provider</b>	<b>ORBIN</b>
<b>Method</b>	Aerobic
<b>Capacity</b>	20 Kg and below
<b>Ideal Community Size</b>	20 Households
<b>Add-on Supplies</b>	Bioclean Cocopeat
<b>Infrastructure size</b>	2ft x 2ft
<b>Processing Time</b>	6 weeks
<b>Investment Cost</b>	Rs. 15,000 per Bin
<b>Running Cost</b>	Depends on the quantity of waste
<b>Operation &amp; maintenance</b>	<ul style="list-style-type: none"> <li>• Segregated waste is added from the top of the unit.</li> <li>• Every time organic waste is added to the unit, sprinkle a thick layer of enzyme powder on it, covering it.</li> <li>• This is simple method of sandwiching the waste between two layers of enzymes (Naturally occurring microbes in a cocopeat based medium).</li> <li>• This enzyme creates air pockets, which allows aerobic composting and no turning of waste is required.</li> <li>• Microbes break the waste, releasing the moisture. This is collected at the bottom most section of the unit, in the form of nutrient liquid.</li> <li>• After 30-40 days, the compost can be harvested from the lower section of ORBIN. An opening for this is provided at the bottom.</li> </ul>
<b>Contact</b>	Email: <a href="mailto:anjana@orbin.in">anjana@orbin.in</a>   Phone: +91 7259404888 Website: <a href="http://www.orbin.in">www.orbin.in</a>



Orbin

## Advisory on On-Site and Decentralized Composting of Municipal Organic Waste

### 7. Solar Composter

Provider	Shree Skanda Solar Systems
Method	Aerobic
Capacity	25 -300 kg per day
Ideal Community Size	30-250 households
Add-on Supplies	Saw dust/ Cocopeat
Infrastructure size	4" X 4"
Processing Time	4 to 5 weeks
Investment Cost	Rs. 1.75 Lakh per digester / 30 households
Running Cost	Rs. 1000 per month / 30 households
Operation & maintenance	<ul style="list-style-type: none"> <li>• Solar Compost Cooker is an aerobic composting device. It utilizes solar heating and solar chimney ventilation principles to speed up composting.</li> <li>• Solar Compost Cooker is designed as a three (3) chamber system. A glass pyramid on the top acts as solar heat collector with an opening to drop wet waste.</li> <li>• Operation:</li> <li>• Mix water &amp; handful of saw dust proportionate to the kitchen wet waste and deposit the mixture through the pyramid door.</li> <li>• Chamber One (Shredder/Mixing) - Drop wet waste every day and turn the handle to mix the waste. Continue to add for about four (4) weeks or longer until it fills the chamber. Pull the separator sheet to drop the mixture to chamber two. Put the separator sheet back and begin adding a new batch of wet waste in the first chamber.</li> <li>• Chamber Two (DIGESTER) - Here, the mixture fully composts for an additional four weeks.</li> <li>• Chamber Three (MATURED) - Finished compost is dried.</li> <li>• A Leachate collection chamber is provided at the bottom to harvest Leachate.</li> </ul>
Contact	Email: <a href="mailto:ysnagendra7@gmail.com">ysnagendra7@gmail.com</a>   Phone: +91 9886197121



Solar Composter

## Advisory on On-Site and Decentralized Composting of Municipal Organic Waste

### 8. Aaga

Provider	Daily Dump
Method	Aerobic
Capacity	18 kg per day / 25 households
Ideal Community Size	25-200 households
Add-on Supplies	Remix powder
Infrastructure	40 sq. ft. covered space
Processing Time	4 weeks
Investment Cost	Rs. 75,000 per pair / Rs. 3,000 per HH
Running Cost	Rs. 1,000 per month / Rs. 40 per month per HH
Operation & maintenance	<ul style="list-style-type: none"> <li>• Collect segregated biodegradable waste from each home into common bucket.</li> <li>• Mix the Remix Powder into the collected waste buckets.</li> <li>• Add kitchen waste in Aaga 1 .</li> <li>• Add Remix Powder on top of the waste daily.</li> <li>• Once Aaga 1 is full, close it and stop adding waste.</li> <li>• Start filling the second Aaga.</li> <li>• Once Aaga 2 is full, close it and stop adding waste.</li> <li>• By then the compost is ready in Aaga 1, harvest and use the bin again.</li> </ul>
Contact	Email: <a href="mailto:hello@dailydump.org">hello@dailydump.org</a>   Phone: +91 99164 26661   Website: <a href="http://dailydump.org">http://dailydump.org</a>

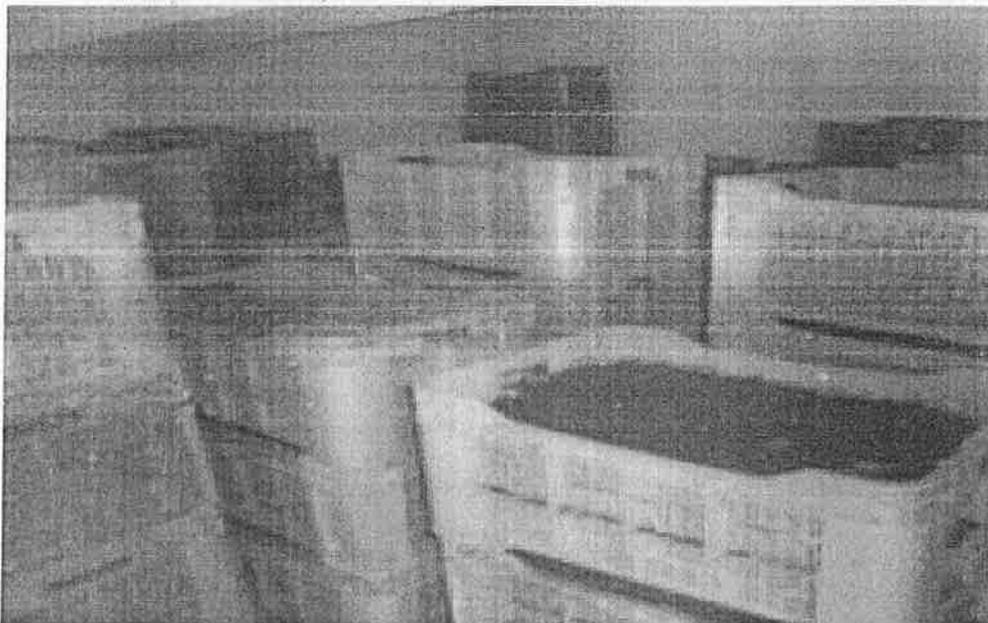


Aaga

## Advisory on On-Site and Decentralized Composting of Municipal Organic Waste

### 9. Plastic crates

Provider	Reap Benefit
Method	Aerobic
Capacity	1 crate = 10 kg organic waste 110 crates required per 100 HH
Ideal Community Size	50-100 households
Add-on Supplies	Upgrade Cocopeat Inoculant
Infrastructure	200 sq. ft. covered space, Shredder
Processing Time	4 weeks
Investment Cost	Rs. 350 per crate / Rs. 400 per HH
Running Cost	Rs. 75 per month per HH
Operation & maintenance	<ul style="list-style-type: none"><li>• Segregated food waste is put through the shredder to cut it up uniformly.</li><li>• Up'Grade is mixed with the shredded food waste in a ratio of 1:3 by volume.</li><li>• The shredded waste and Up'Grade mixture is left to cure in the plastic crates for 25 days to makecompost.</li></ul>
Contact	Email: <a href="mailto:info@reapbenefit.in">info@reapbenefit.in</a>   Phone: +91-99866 15136 / +91-98863 61805, Website: <a href="http://reapbenefit.in">http://reapbenefit.in</a>

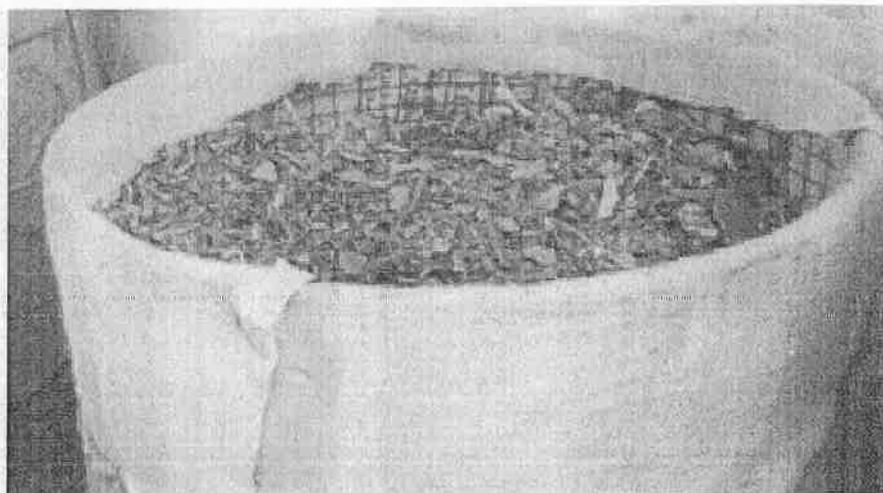


Plastic Crates

## Advisory on On-Site and Decentralized Composting of Municipal Organic Waste

### 10..Steel Mesh Composter

Provider	This method devised by Rainbow Drive RWA, Bangalore
Method	Aerobic
Capacity	1 unit = 50 kg per day
Ideal Community Size	200+ households or independent layouts
Add-on Supplies	Sawdust, dry leaves
Infrastructure	500 sq. ft. covered space
Processing Time	6 weeks
Investment Cost	Rs. 2,500 per unit / Rs. 50 per HH
Running Cost	Rs. 2000 per month (per HH almost Nil)
Operation & maintenance	<ul style="list-style-type: none"> <li>• Put together a square-shaped platform using a few cement slabs.</li> <li>• Leave some gap between each slab so that leachate, if any, drips down easily.</li> <li>• Place a steel mesh plate on top of the slabs to prevent entry of rodents from the bottom.</li> <li>• Make a steel mesh ring of 3 ft diameter and 2.5 ft height (open cylinder).</li> <li>• Place this ring on the platform.</li> <li>• Wrap the ring with gunny sack to avoid the contents from spilling out and messing up the surroundings.</li> <li>• This also prevents rodents from digging into the piles.</li> <li>• Collect the segregated kitchen waste.</li> <li>• Sprinkle little bit of saw dust on it to absorb excess moisture.</li> <li>• Spread a thick layer of (at least 8-10 inches) dry leaves at the bottom of the composter.</li> <li>• This absorbs the moisture content seeping down from the top layers.</li> <li>• Add the bio degradable waste and dry leaves to the composter in alternative layers.</li> <li>• The top portion is always filled with dry leaves to ward off fruit flies, odour, mosquitoes and rodents.</li> <li>• Leave the composter for about 15-20 days.</li> <li>• Afterwards remove and lay it for maturing for another 30 days.</li> <li>• After a total of about 45 days, the compost is ready. Sieve it and store it for consumption.</li> <li>• Bigger and not fully composted parts sieved out are once again added to the composter for composting.</li> <li>• Keep the place tidy and ensure that it is airy and covered (to save from sun and rain).</li> </ul>
Contact	Email: kpsingh06@gmail.com   Phone: +91 98451 77160 Address: Rainbow Drive Layout, opposite Wipro Corporate Office, Sarjapur Road, Bangalore

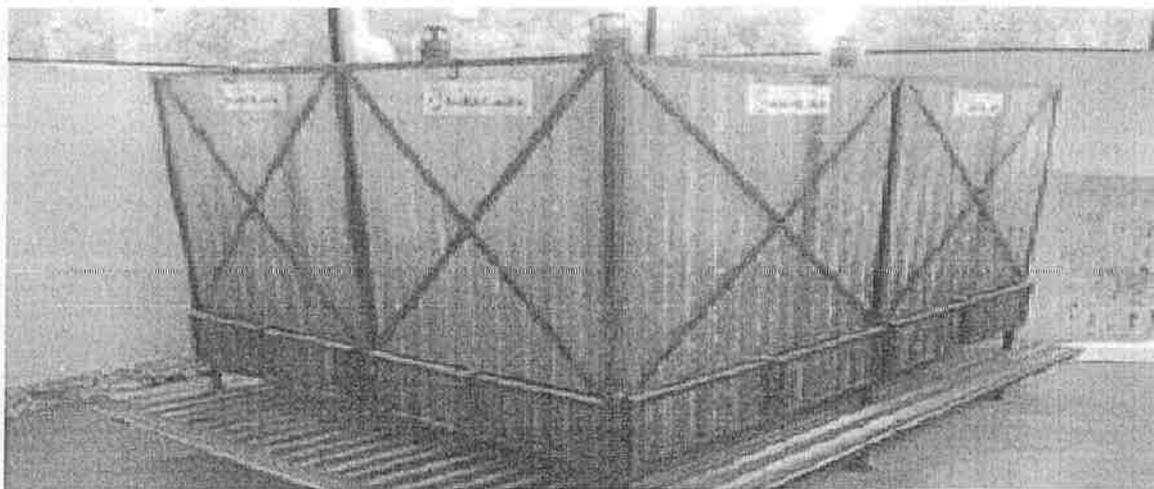


Steel Mesh Composter

## Advisory on On-Site and Decentralized Composting of Municipal Organic Waste

### 11. FRP Aerobic Digester

Provider	Shudh Labh
Method	Aerobic
Capacity	40-50 kg per day 80 households
Ideal Community Size	50-500 households
Add-on Supplies	Bioclean Cocopeat
Infrastructure	150 sq. ft. covered space
Processing Time	10 weeks
Investment Cost	Rs. 63,000 per digester
Running Cost	Rs. 4,000 per month / Rs. 50 per month per HH
Operation & maintenance	<ul style="list-style-type: none"> <li>• Initial layering needs to be done by placing a 5kg coco peat block, 1 or 2 buckets of Browns (Dry Leaves), and ~ 2 kg of compost.</li> <li>• Layer about 6-8Kgs of Kitchen waste – Ensure this is well segregated waste and is evenly layered.</li> <li>• Add about 100-200gms of Bioclean powder (cocopeat with composting Microbes).</li> <li>• After the above 3 steps, on daily basis add a layer of Kitchen waste (6-8Kgs) and Bioclean Powder(100-200gms) and some browns. Each of this should be layered well.</li> <li>• Once a week, soak a handful of Neem powder in water and sprinkle this water into the digester. This helps in reducing the flies, insects and odor.</li> <li>• Cow dung, Cow urine, panchagavya or sour curd if available, can be added to increase the natural microbial activity and reduce foul smell and insects.</li> <li>• 8-10 weeks is the processing time and the first batch of manure will be ready.</li> <li>• Spread the extracted compost on the plastic sheet and allow it to dry for a day or two in shade.</li> <li>• After the compost is dry, sieve the compost to produce fine manure and store the fine sieved manure in a dry place away from direct sunlight.</li> <li>• The left over compost after sieving can be added back to the digester.</li> <li>• From the second batch the compost can be extracted every 2nd / alternate week.</li> </ul>
Contact	Email: <a href="mailto:info@sudh-labh.in">info@sudh-labh.in</a>   Phone: +91 9964508833 Website: <a href="http://www.sudh-labh.in/index.html">http://www.sudh-labh.in/index.html</a>



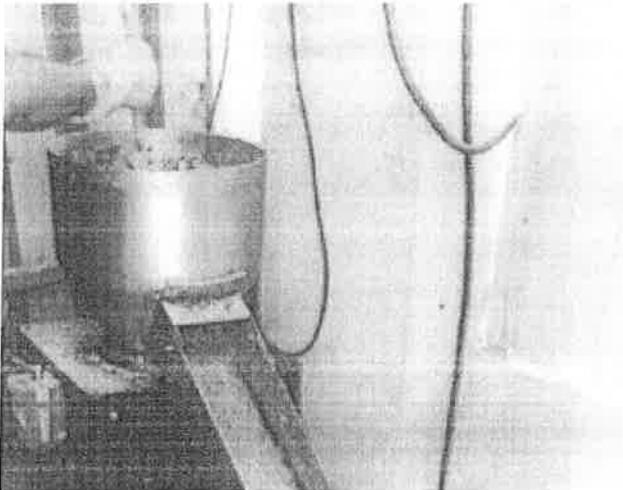
FRP Aerobic Digester

## Advisory on On-Site and Decentralized Composting of Municipal Organic Waste

### . Large Scale Composting Pits

Method	Aerobic
Infrastructure	Kept in covered in enclosure
Processing Time	45 days
Operation & maintenance	<ul style="list-style-type: none"><li>• The segregated biodegradable waste is shredded and mixed with saw dust &amp; dry leaves in a Shredder cum Blender.</li><li>• The Shredder cum Blender (powered by a 2HP motor running on 2 Amps power) generates a semi solidhomogenous matter or paste which is finally put into the compost pit.</li><li>• The pit is properly secured by steel wire mesh to prevent rodents or mosquitoes.</li><li>• At any particular point of time, one compartment is always kept empty to ensure that the churning of themixture happens properly.</li><li>• Almost on a daily basis, the mixture from the pits is shuffled from one pit to another.</li><li>• While churning, add the culture and cow dung on top of the mixture</li><li>• The compost pits are built to have maximum aeration and have outlets which drains off the compost leaor moisture from the pit. This ensures that the mixture does not stink or create worms.</li><li>• After 40 days, the compost will be ready in the pit.</li></ul>

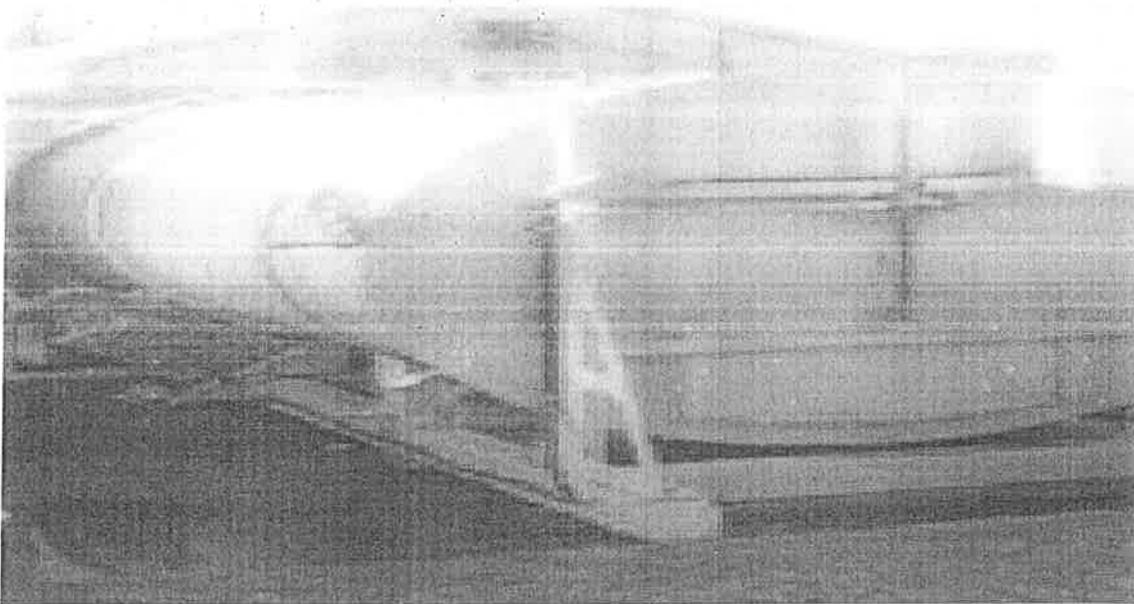
Large Scale Composting Pits



## Advisory on On-Site and Decentralized Composting of Municipal Organic Waste

### Rotary Drum Composter (Large)

Method	Aerobic
Processing Time	1-7 days
Description	<ul style="list-style-type: none"> <li>• Drum systems typically consist of a steel drum with a diameter between 1.5 and 5 m.</li> <li>• In small-scale systems, the drums have a length of up to 10 m.</li> <li>• By comparison, large-scale systems use drums that are significantly longer (i.e., 30 to 80 m).</li> <li>• The drums are positioned on a slight incline (less than 5%) and rotate at between 0.5 and 5 rotations per minute (rpm).</li> <li>• The combination of the drum's rotation and incline, with gravity, results in materials tumbling down the drum in a corkscrew manner from the upper in-feed end to the lower discharge end.</li> <li>• Air is typically injected into the drums, usually at the discharge end, to meet process air requirements.</li> <li>• The loading and unloading doors and the drive mechanisms introduce a higher degree of mechanical complexity and maintenance requirements relative to other in-vessel composting systems.</li> <li>• Drum capacities for smaller-scale systems range from 5 to 50 m<sup>3</sup>;</li> <li>• Generally, the drums are loaded to between 65 to 80% of their total volume. Loading more material into the drum prevents materials inside from tumbling and reduces processing efficiency.</li> <li>• A drum's annual capacity is determined by how much is unloaded from the drum and how often.</li> <li>• Rotating drums are usually designed with a composting time of one to seven days.</li> <li>• With composting times this short, the material emerges without having completed the active composting step and needs further treatment.</li> </ul>



Rotary Drum Composter (Large)



## 1. INTRODUCTION

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Increased waste generation and its management is an escalating issue in urban areas. Some of the major challenges faced by governmental authorities in the field of solid waste management, especially non-biodegradable (dry) waste management:

- (i) Increase in amount and type of waste generated especially non-biodegradable (dry) waste due to rapid urbanisation and increasing consumerism.
- (ii) Lack of space for handling and processing the generated waste.
- (iii) Inadequate resources, infrastructure, waste management systems and funding for proper waste management.

Swachh Bharat Mission (Urban) was launched in 2014 by Ministry of Housing and Urban Affairs to provide sanitation and promote cleanliness in urban areas. The objectives included providing household and public toilets, proper solid waste management systems, capacity building and creating public awareness regarding sanitation and waste management. Thereafter, the Ministry of Environment, Forest and Climate Change had notified the Solid Waste Management Rules 2016 ("SWM Rules") under the Environment (Protection) Act, 1986 to manage the municipal solid waste generated in the country. Some of the duties relating to dry waste management under the SWM Rules include:

- (i) Allocation of land for setting up facility for dry waste processing and treatment
- (ii) Establishment of materials recovery facility<sup>1</sup> and secondary storage facility
- (iii) Channelising the dry waste streams for recycling and waste to energy plants

The state of Karnataka has adopted a policy and strategy for solid waste management under SWM Rules which has extensive provisions relating to dry waste management. In pursuance of the state strategy framework by the government, the Directorate of Municipal Administration, Government of Karnataka (DMA) has initiated pilot materials recovery facilities (MRFs) projects in all districts of the state for managing dry waste in a sustainable manner. The proposed MRFs will have a capacity of managing 10-15 tons of dry waste per day. This report gives the details of standardised list of equipment to be procured for a MRF with a capacity of handling 15 TPD of dry waste, indicative capital expenditure for the MRF and standard layout of the MRF.

## 2. EQUIPMENT FOR MRF ALONG WITH PROCESS AND MANPOWER

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### 2.1. MRF EQUIPMENT

The MRF layout as well as the list of equipment included below is general and will need to be customised as per the local conditions and requirements of the ULB on factors such as:

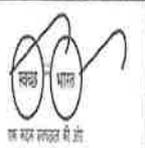
- (i) Type of waste coming into the MRF i.e., fully source segregated dry waste or mixed waste in parts

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<sup>1</sup> According to SWM Rules, 2016 "materials recovery facility" (MRF) means a facility where non-compostable solid waste can be temporarily stored by the local body or any other entity or any person or agency authorised by any of them to facilitate segregation, sorting and recovery of recyclables from various components of waste by authorised informal sector of waste pickers, informal recyclers or any other work force engaged by the local body or entity for the purpose before the waste is delivered or taken up for its processing or disposal.

**STANDARD DESIGN, LIST OF EQUIPMENT AND  
MANPOWER FOR MATERIALS RECOVERY  
FACILITY**

# CONSTRUCTION & DEMOLITION WASTE | DRAFT POLICY & STRATEGY



## INTRODUCTION

### Construction & Demolition Waste

Waste comprising of building materials, debris & rubble resulting from construction, remodelling, repair & demolition of any civil structure

Excavation/laying of asphalt/concrete roads

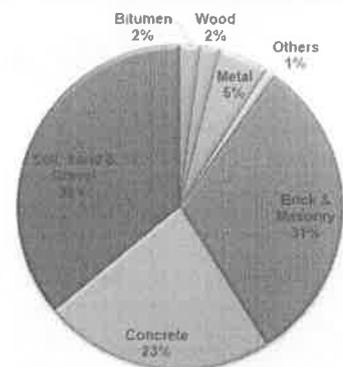
Installation & service of public utilities (telephone/water/electricity/sewage pipelines)

Construction of new buildings

Renovation of existing buildings

Demolition of old buildings

Construction & renovation of public infrastructure such as bridges, flyovers metro construction



**Typical Composition of C&D Waste (TIFAC, 2001)**

# INTRODUCTION

## CURRENT SCENARIO

- Rapid urbanization
- Often C & D waste is mixed with solid waste
- Lack of data & systems around C & D waste

C & D waste generated:

India – 100 million MT / year  
Bangalore – 875 MT/day

Minimal C & D Waste, used for filling, levelling and resource recovery.

Major part of the waste - dumped in landfills, pavements, open spaces, etc.

Construction and Demolition Waste Management Rules – Issued by Government of India, March 2016.



## **OBJECTIVES**

**To ensure at least 50% of C&D Waste generated in the state of Karnataka is reused or recycled by 2023.**

**To ensure that no C&D Waste is dumped in open spaces in Karnataka by 2025.**

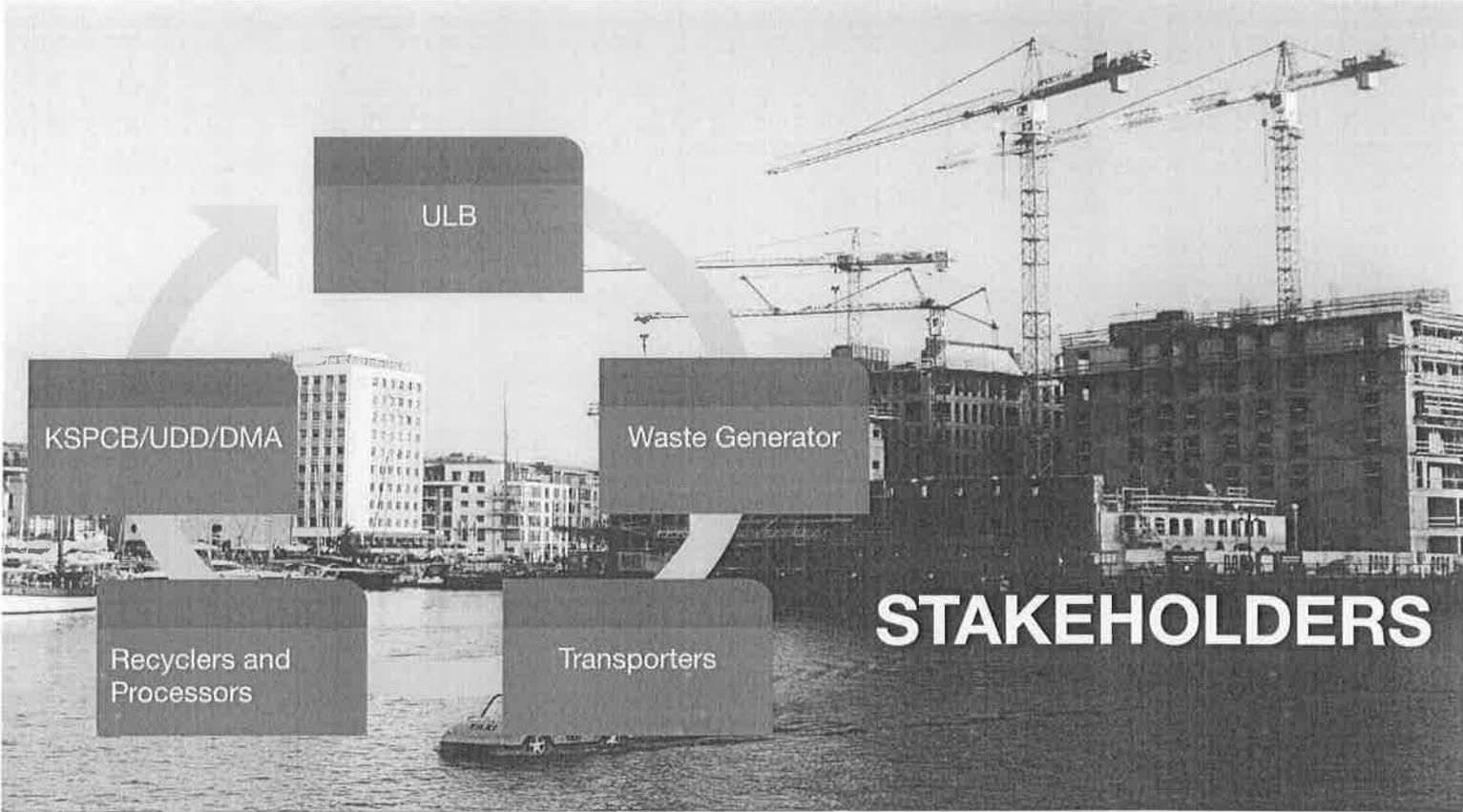
## GUIDING PRINCIPLES

Reduce & Reuse: Source reduction & Deconstruction prior to demolition

Recycle: Encourage recycling of C&D waste & develop market for recycled products

Awareness creation for citizens and industry. Capacity building of ULBs

Financially viable C&D waste management systems



ULB

Waste Generator

KSPCB/UDD/DMA

Recyclers and Processors

Transporters

# STAKEHOLDERS

## TYPES OF WASTE GENERATORS



01

**Micro - Generator**  
less than 50 kgs of  
waste

02

**Small - Generator**  
More than 50 kgs  
and less than 20  
MT/day

03

**Bulk - Generator &  
Service Provider**  
More  
than 20 MT/day or 300  
MT per project in a  
month

## Requirements for C&D waste management by each generator

### Micro Generators

Store C&D Waste on the premises in an appropriate storage medium

Contact the ULB through an online portal, by telephone or any other prescribed method for the transportation of their C&D Waste.

Handover the C&D Waste on the designated day per month during D-to-D collection

Can also use the designated services of service providers identified by the ULB and pay prescribed fees

### Small Generators

Store C&D Waste on the premises in an appropriate storage medium

Can deposit of C&D Waste at collection centres.

C&D Waste can be collected by the ULBs through itself and/or authorised private party on payment basis.

Small generators are ultimately responsible for ensuring that the C&D Waste is disposed off responsibly & shall procure a receipt from the designated location for C&D Waste where authorised service providers are used.

## Requirements for C&D waste management by each generator

### Bulk Generators and Service Providers

Responsible for carrying out end to end C&D Waste management.

Segregate their C&D Waste onsite into minimum four streams such as:

- Concrete,
- Soil,
- Steel, wood and plastics,
- Bricks and mortar

Should set up their own debris site, either individually or in collaboration with other developers or contractors.

For in-situ processing of C&D Waste incentives can be provided by the ULBs.

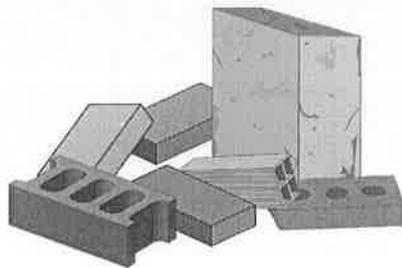
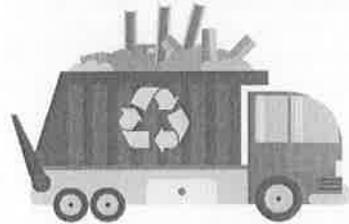
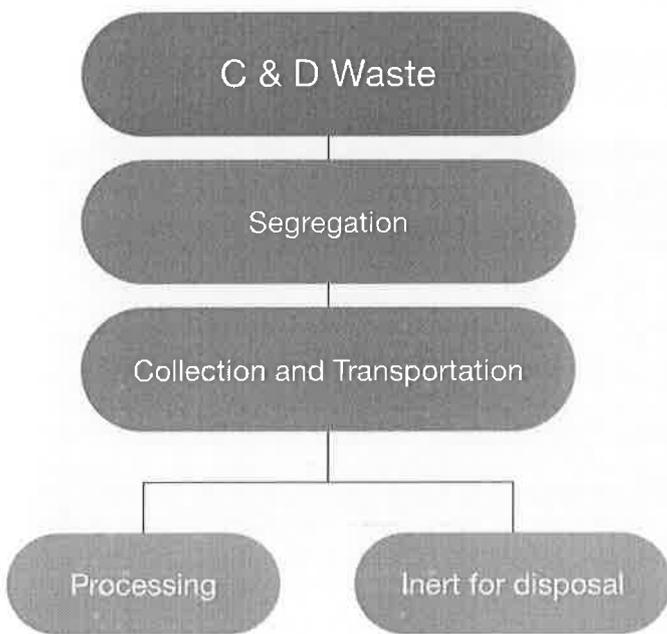
When in-situ management is not possible,

- C&D waste management facilities set up by the ULB may be used upon payment of prescribed fees.
- Service Providers to remove all C&D Waste and clean the area every day. If not possible, a reasonable timeframe shall be worked out in consultation with the concerned ULB for C&D waste management.

For large public projects, the area should be cordoned off and the C&D Waste should be stacked separately without causing any disturbances to the public.

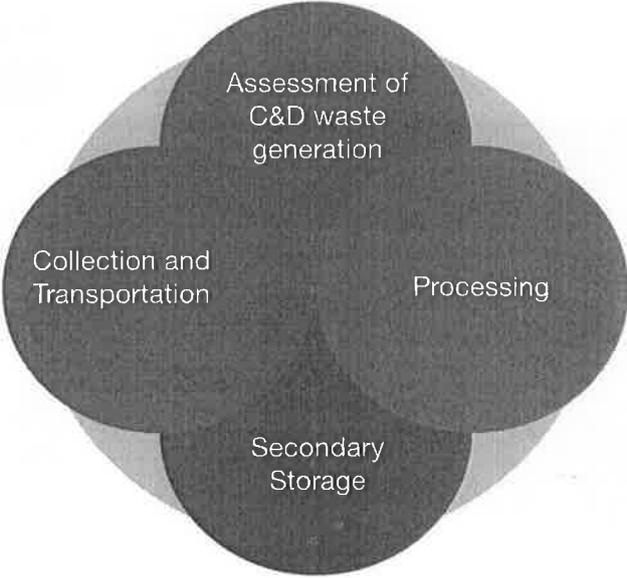
Debris site shall be set up in compliance with the criteria for C&D Waste as issued by CPCB, KSPCB and other relevant regulatory bodies.

## FLOW OF C & D WASTE





# DUTIES OF ULB



## ASSESSMENT OF C&D WASTE GENERATION

### ❑ TIFAC Thumb rule

Understand the area of buildings/projects that will undergo construction/demolition to adopt this methodology.

Link building permits to C&D waste generation database.

Type	Waste Generated in kg/m <sup>2</sup>
Construction	40-60
Renovation and Repair work	40-50
Demolition of pucca building	500
Demolition of semi pucca building	300

## COLLECTION, TRANSPORTATION AND STORAGE

ULBs should make arrangements for collection and transportation of C&D Waste distinct from MSW and based on types of generators

When there is shortage of resources like manpower, vehicles, etc. ULBs can engage competent private entities. Important to register, regulate and monitor such agencies.

For bulk waste generators, larger ULBs can create a system of renting skips, hook loader bins or other suitable containers for storage of C&D Waste at source.

Rates for collection, transportation & processing of C&D Waste should be prescribed.

Mapping, and communication technologies such as GPRS, GPS etc. can be used by the ULBs for monitoring



## COLLECTION, TRANSPORTATION AND STORAGE

### Storage

To store small quantities of waste, (i) construct an enclosure at each common debris sites or (ii) place tractor trolley at each such location.

KSPCB should monitor the private entities' operations in accordance with applicable regulations.

Private parties desirous of temporary C&D Waste storage, the ULB may issue a 'designated collection centre/transit station' certificate after assessing the suitability of the site after an application process

The C&D Waste deposited at each collection centre/transit station should be weighed and records of C&D waste should be maintained

### MINIMUM ARRANGEMENTS FOR SECONDARY STORAGE OF C&D WASTE

Type of ULB	Number	Service to
All ULBs	At least one station should be set for deposit of C&D waste	Micro Generators, Small Generators & Bulk Waste Generators in Town Panchayats and Town Municipal Council
City Municipal Council & City Corporations	At least three common debris sites	Micro Generators & Small Generators  Bulk Waste Generators, if there is space available upon payment of fees
City Corporations	Transit stations based on population, availability of space, development plans etc.	Bulk Waste Generators and Service Providers upon payment of tipping fee

# PROCESSING OF C&D WASTE

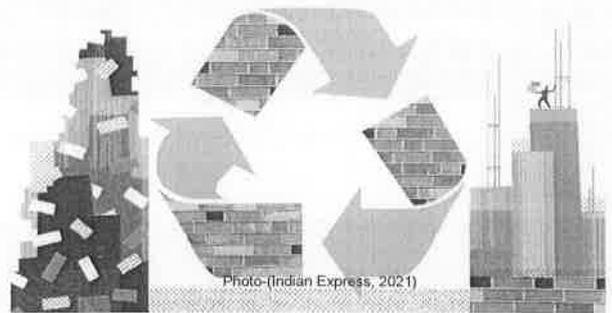
## RECYCLING OF C&D WASTE

### Recycling - Dry Process

Segregation, primary and secondary crushing, screening

### Recycling - Wet process

Segregation, primary and secondary crushing, washing and screening



Different grades and sizes of aggregate - Recycled products



## MINIMUM ARRANGEMENT FOR PROCESSING OF C&D WASTE:

ULB generating at least 100 MT per day	→	At Least one C&D waste processing facility
ULB generating at less than 100 MT per day	→	Can set up facilities based on regional or cluster basis
ULB current generation more than 2000 TPD	→	More than one plant for recycling of C&D waste
When availability of land is a concern or low C&D waste generation	→	<ol style="list-style-type: none"><li>1. Semi-mobile or mobile C&amp;D waste processing plants</li><li>2. Upgrade existing stone crushing units with substantial idle capacity</li></ol>

## PRIVATE PARTIES

When engaging private agencies ULB should take into account the following:

ULB should prepare a list of services that need to be outsourced with a justification note mentioning the potential cost - benefits analysis and risks involved

Introduction of private players in a competitive and transparent manner in C&D management will provide access to latest technology, skilled manpower and economic efficiency.

Contractor requirements: Relevant experience, technical and financial capabilities. Involvement of private parties through Karnataka Transparency in Public Procurement Act, 1999

Setting up secondary storage & processing facilities - Public Private Partnership (PPP) model [ Build, Operate, Own (BOO) or Build, Operate, Transfer (BOT)]

Create model agreements for C&D waste management:

- Clear and free from ambiguities
- Deposit of waste at designated sites and no fly-tipping
- Link to Key performance indicators such as service coverage, compliance with labour regulations & EHS standards, recovery of resources for payment
- Grievance redressal mechanism
- Force majeure clause where the removal of waste after a disaster etc.
- Arbitration with Karnataka Arbitration Centre instead of the ULB in charge officer/the District Commissioner.
- Agreed fee per tonne of waste that is collected, transported and/or processed

# COMPLIANCE REQUIREMENTS

Facilities for C&D Waste should comply with provisions of C&D Rules and sites should be selected as per Schedule I of the C&D Rules.

Pollution and environmental norms should be as per Guidelines on Environmental Management of Construction & Demolition (C&D) Wastes issued by the CPCB

Regular compliance inspections should be conducted by ULB

To minimise environmental impacts facilities shall maintain a setback distance or buffer zone as per CPCB guidelines

The ULBs should create model **by-laws** mandating C&D waste management by different stakeholders and fix relevant charges and penalties



ULBs having a population less than 10 lakhs	Monitored by KSPCB 2 times a year, i.e. once in 6 months
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ULBs having a population of more than 10 lakhs	Monitored by KSPCB 3 times a year, i.e. once in 4 months
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**ACTION PLAN WITH TARGET TIMELINES FOR SETTING UP C&D WASTE MANAGEMENT OPERATIONS BY ULB**

SI No.	Action Plan / Action Item	Timeline for TP & TMC	Timeline for CMC	Timeline for CC
1.	Notifying the Bye laws for C&D Waste Management	6 months	6 months	6 months
2.	Notification for setting up of Common Debris Sites and identification of land for such sites	1 year	1 year	1 year
3.	Notification for setting up of Transit Sites and identification of land for such sites	N.A.	N.A.	1 year
4.	Setting up a separate collection system for C&D Waste, hotline numbers etc.	1 year	1 year	1 year

**ACTION PLAN WITH TARGET TIMELINES FOR SETTING UP C&D WASTE MANAGEMENT OPERATIONS BY ULB**

SI No.	Action Plan / Action Item	Timeline for TP and TMC	Timeline for CMC	Timeline for CC
5.	Notification for mandatory use of recycled products in all constructions with required limits of usage in each category of plain concrete, reinforced concrete and lean concrete	100%	1 year	
6.	Setting up of Common Debris Sites	2 years	18 months	18 months
7.	Setting up of Transit Sites	N.A.	N.A.	18 months
8.	Setting up of Processing and Recovery Facilities	3 years	2 years	2 years

## MARKET DEVELOPMENT AND PROMOTION OF C&D RECYCLED PRODUCTS

Development of the market for recycled aggregates is critical for economic viability of C&D waste processing facilities. ULBs can give incentives for use of material made out of C&D Waste. State government is mandatorily required to procure upto 10 - 20 % of materials made from C&D Waste in municipal and government contracts subject to strict quality control.

### Initiatives taken by differential government authorities:

<b>BIS</b>	<p>Amended specification i.e. IS 383: 2016 Indian Standard coarse and fine aggregate for concrete – specification (third revision) include “manufactured aggregates produced from other than natural sources” for use in the production of concrete for normal structural purposes. These manufactured aggregates are of two types:</p> <p>Recycled Aggregate (RA): It is made from C&amp;D waste which may comprise concrete, brick, tiles, stone, etc.</p> <p>Recycled Concrete Aggregate (RCA): It is derived from concrete after requisite processing.</p>
<b>National Building Code (NBC)</b>	<p>RCA may be used in concrete for bulk fills, base/fill of drainage structures, pavements, kerbs and gutters etc</p> <p>Up to 30% of natural crushed coarse aggregate can be replaced by the RCA</p> <p>Upto to 50% for pavements and other areas which are under pure compression specific to the standards and practices pertaining to construction of roads.</p>
<b>CPWD and NBCC</b>	<p>Promote 20% replacement of aggregates in RCC with RCA and 100% replacement of aggregates with RCA in light or non-load bearing lean concrete.</p>

## MARKET DEVELOPMENT AND PROMOTION OF C&D RECYCLED PRODUCTS

### State government level

C&D recycled products will require certification from credible third parties. Introduce standardisation and testing norms for C&D recycled products.

Aggregates, sand, blocks, granular sub-base etc. made from C&D waste material to be included in the PWD schedule of rates

All government agencies and departments should include the use of C&D Waste products for appropriate use in government contracts, tender and institutional purchase mandates

### District and/or ULB level

Departments like PWD, Housing Development Board/Authority, City Development Authority, public sector utility companies (such as BESCO) can acknowledge recycled C & D waste as a genuine substitute for conventional products by use recycled materials in public works. This would encourage private parties.

Use C & D waste in road construction as fillers.

## MARKET DEVELOPMENT AND PROMOTION OF C&D RECYCLED PRODUCTS

<b>State government level</b>	<p>Building ratings like GRIHA, LEED etc. should explore factoring a building's resource consumption, waste generation &amp; utilisation of C&amp;D Waste/recycled products in the "green buildings"/ "green rating" certification.</p> <p>The State should give incentives, like tax breaks for C&amp;D processing units, manufacturing of C&amp;D waste recycled products.</p> <p>Mandatorily use recycled products in projects under the Smart Cities Mission and AMRUT and Housing for All (Pradhan Mantri Awas Yojana)</p>	<b>District and/or ULB level</b>	<p>Involve CREDAI, KPWB, KHB - in promotion of use of recycled products and to create linkages to increase access to reuse and recycled material availability</p> <p>Tenders for any infrastructure to require the bidders to specify the quantity of C&amp;D waste that will be generated, details of its management and the designated location for processing of the C&amp;D Waste generated. All payments for disposal of C&amp;D waste linked to verification of disposal at designated site.</p>
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## **ACTION PLAN WITH TARGET TIMELINES FOR PROMOTION OF C&D WASTE RECYCLED PRODUCTS**

SI No.	Action Plan / Action Item	Timeline for TP and TMC	Timeline for CMC	Timeline for CC
1.	Enforcement of requirement of CPWD and National Buildings Construction Company to use recycled portions of C&D waste in their construction activities if the same is available within 100km from the construction site.	1 year	6 months	6 months
	Procure upto 10 - 20 % of materials made from C&D Waste in municipal and government contracts subject to strict quality control.			
2.	Notification for mandatory use of recycled C&D products for at least 50% of requirement pertaining to non-structural use such as paver blocks, manhole cover, tiles etc. in ULB tenders	2 years	1 year	1 year

## WASTE MANAGEMENT PLAN

Bulk producers &  
Service providers

Submit waste management plan  
and get approval before the start of  
the project

ULB

Sanction the waste management plan  
within a period of one month from the date  
of its submission or the date of approval of  
building plan, whichever is earlier.

Projects over the value of  
specified value such as Rs.  
100 crores

Must appoint an environmental officer, whose  
duties are:

- Prepare plan and submit to the ULB
- Ensure proper disposal of C & D waste
- Waste minimisation
- Increase onsite reuse and recycling
- Compliance with regulations

# WASTE MANAGEMENT PLAN

## Components of Waste Management Plan:

Details of the proposed site and intended C&D Waste recycling, recovery operations (including onsite). Project to demonstrate at the end of construction that 100% of the waste generated is received at the debris site and is either recycled or reused to obtain no objection clearance for the project.

Type of construction or demolition along with proposed size and location.

Demarcated places onsite where different C&D Waste will be sorted and stored for dispatch.

Details of contractors/transporters, if any and their planned destinations for different types of C&D Waste

Proposed transit sites and processing facilities and its distance from the project site.

Plans for recycling or reuse of different types of C&D Waste

Plans with quantities of recycled C&D materials which will be used in construction, with on-going proof of use.

Plans for waste minimisation

Details of the person or firm ultimately responsible for compliance.

Disaster management plan which should cover emergency responses

## WASTE MANAGEMENT PLAN

The ULB should identify the appropriate governmental department and/or officials to whom the bulk generators and service providers will submit their waste management plan.

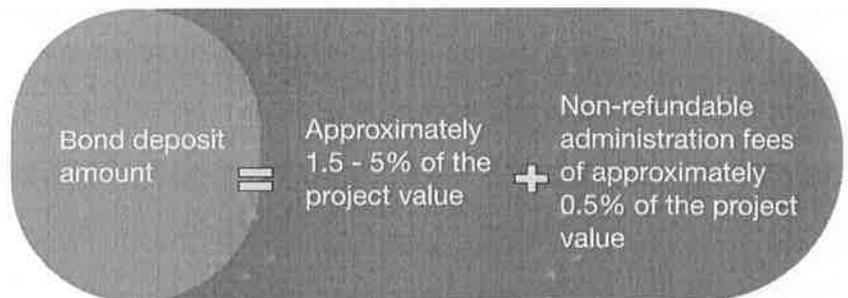
### **Who should this be?**

In addition to the waste management plan, ULBs should adopt a bond-deposit based approach to successfully reach recycling targets or comply with C&D Rules.

### **Bond-deposit based approach**

A compliance deposit, or bond, is paid as performance security when applying for building permits and/or submitting the waste management plan.

This amount is refunded as and when minimum recycling requirements or disposal requirements are met.



## NORMATIVE STANDARDS FOR A WASTE MANAGEMENT PLAN

**Note 1: Estimating waste generation**

**Note 2: Identifying common materials that are found at construction site**

**Note 3: Storage area size estimation**

### Waste generation estimation

Type	Waste Generated in kg/m <sup>2</sup>
Construction	40-60
Renovation and Repair work	40-50
Demolition of pucca building	500
Demolition of semi pucca building	300

### Some of the common material found

Excavation and foundation works and super structures
Explosives and related products and equipments
Fuels, chemical, plastics, electronic items
Finishing and interiors
Wood dust, paints, batteries
Lamps, tubes, mercury containing debris

### Storage area size estimation

Built up area	Size of storage area (sq.ft)
<5000 sqft	82
5001-15,000 sqft	125
15001-50,000 sqft	175
50,000 – 100,000 sqft	225
100,001 – 200,000 sqft	275
>200001 sqft	500

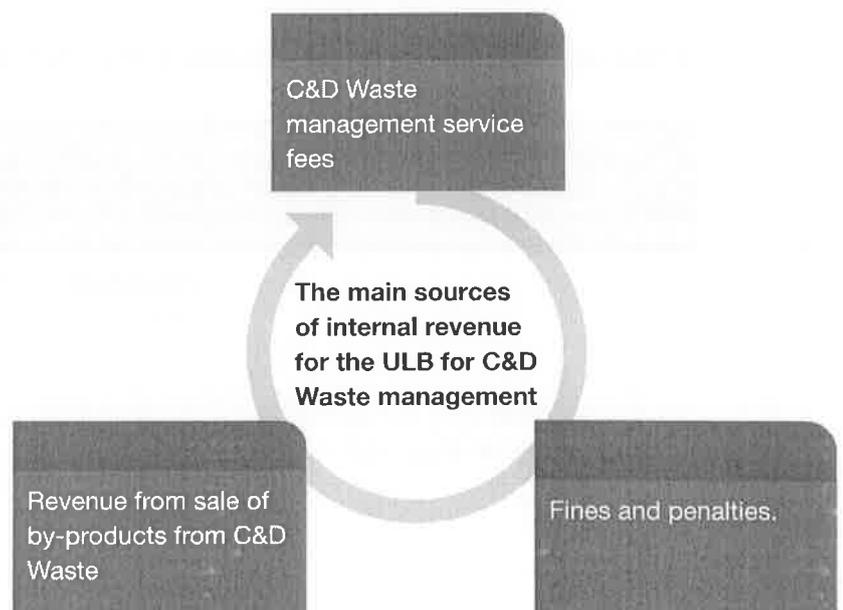
## FINANCIAL SUSTAINABILITY AND PENALTIES

Financially viability through internal sources of revenue and efficient operations.

ULBs should frame bye-laws for management of C&D Waste under the KMA and the KMCA to include service fees and penalties for non-compliance.

Service fee should be dependent on type of generator, amount of waste generated and type of ULB.

Penalties be structured as a waterfall arrangement. Fourth contravention should result in cancellation of construction license.



## **ILLUSTRATIVE RATES FOR SERVICE CHARGES**

### **PART I –Service Charges payable by Waste Generators except Bulk Waste Generators**

S.No	Type of Waste Generator (excluding Bulk Waste Generators)	Service Charges per month from each Waste Generator to be not less than:		
		Population > 10 lakhs	Population >= 3 lakhs and < 10 lakhs	Population < 3 lakhs
1.	For collection, transportation & transportation of C&D Waste	Rs. 60 per ton per kilometre	Rs. 40 per ton per kilometre	Rs.30 per ton per kilometre

## **PART II – Service Charges payable by Bulk Waste Generators**

For Bulk Waste Generators who do not transport their own C&D Waste, Service Charges shall be

S.No	Type of Waste Generator (excluding Bulk Waste Generators)	Service Charges per month from each Waste Generator to be not less than:		
		Population > 10 lakhs	Population >= 3 lakhs and < 10 lakhs	Population < 3 lakhs
1.	For collection and transportation of C&D Waste	Rs.100 per ton per kilometre	Rs. 80 per ton per kilometre	Rs.60 per ton per kilometre
2.	For processing of C&D Waste	Rs.300 per ton	Rs. 200 per ton	Rs. 100 per ton

## ILLUSTRATIVE PENALTIES FOR NON-COMPLIANCE

S. No	Offence	Bulk Waste Generator/Service Provider (in INR)	Small Waste Generator (in INR)	Transporter (in INR)
1.	Dumping of construction and demolition waste in storm water drains, open spaces and other non-designated areas	8,000 per ton of C&D Waste dumped	4,000 per ton of C&D Waste dumped	6,000 per ton of C&D Waste dumped
2.	Mixing of C&D Waste with any other waste stream	8,000 per ton of C&D Waste mixed	4,000 per ton of C&D Waste mixed	6,000 per ton of C&D Waste mixed

## ILLUSTRATIVE PENALTIES FOR NON-COMPLIANCE

S. No	Offence	Bulk Waste Generator/Service Provider (in INR)	Small Waste Generator (in INR)	Transporter (in INR)
3.	Failure to start construction, demolition or renovation works without submission and approval of the waste management plan	<p>(i) 50,000 if the proposed built up area of the construction/infrastructure is 3000 square feet or less.</p> <p>(ii) For constructions having built up area of 3000 square feet or more, INR 5,000 for every 100 square feet of built up area.</p>	N.A.	N.A.
4.	Deviations and/or non-compliance of the conditions of the waste management plan	<p>(i) 50,000 if the proposed built up area of the construction/infrastructure is 3000 square feet or less.</p> <p>(ii) For constructions having built up area of 3000 square feet or more, INR 5,000 for every 100 square feet of built up area.</p>	N.A.	N.A.

## CAPACITY BUILDING AND AWARENESS



The ULBs should arrange training on the C&D Rules, bye-laws, CPCB and KSPCB guidelines and any other relevant material to all relevant government officials

Different training and awareness for various levels of government officials.

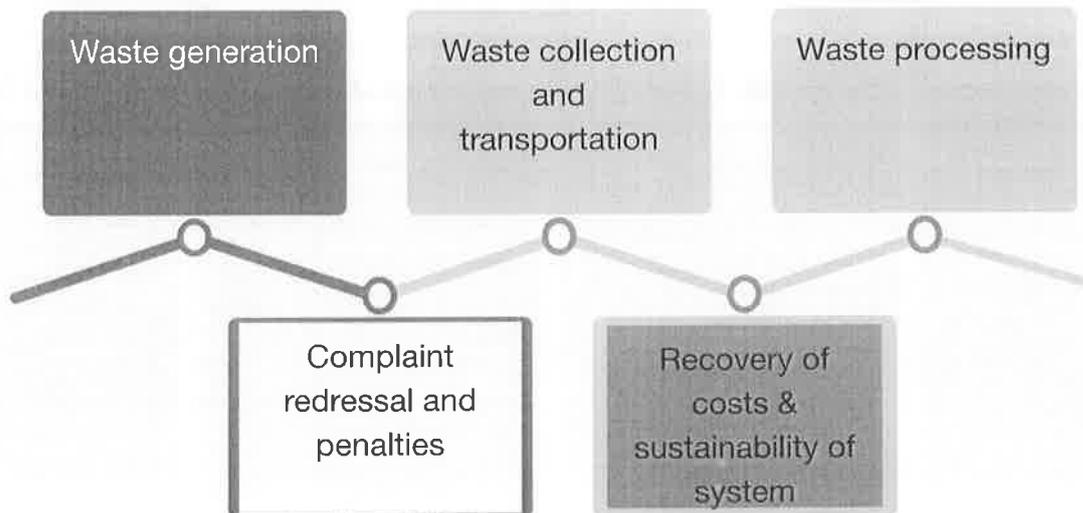
State to earmark adequate amounts for training and capacity building of all levels of staff at regular intervals

Sustained engagement with the construction industry such as collaboration with industry associations such as BAI, CREDAI

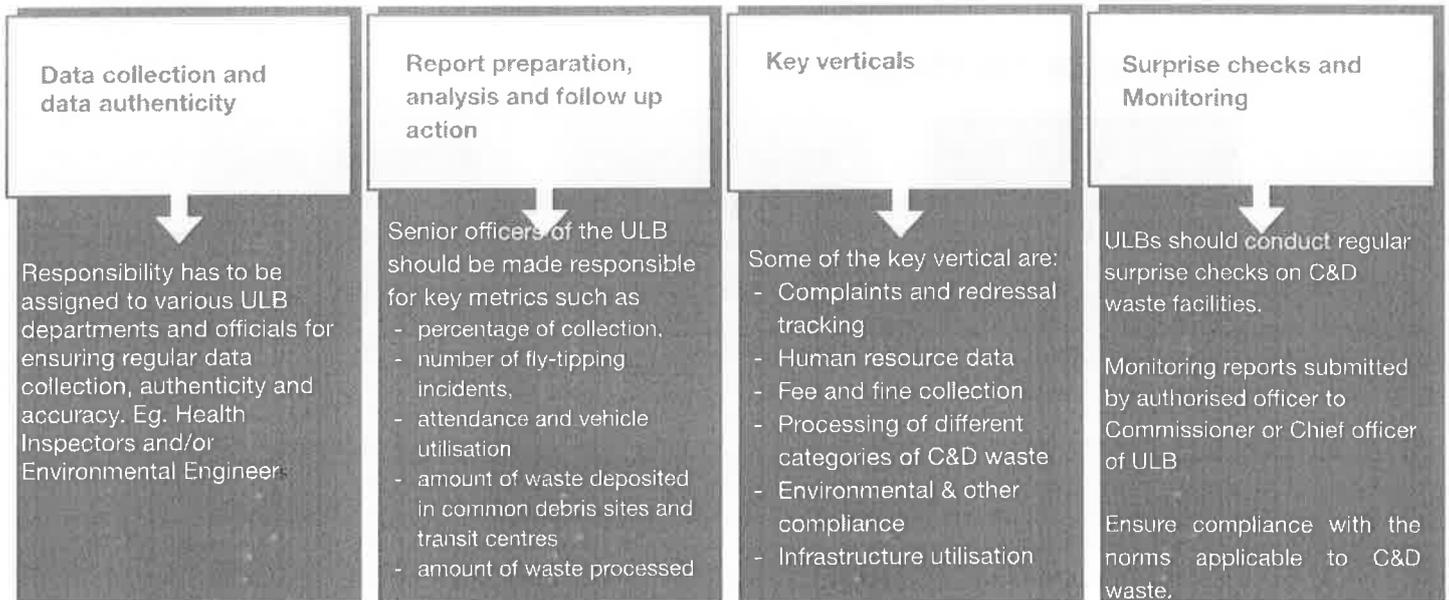
There should be a separate section on management C&D Waste on the ULB website (i) publicise the issues arising out of mismanagement of C&D Waste (ii) , service charges and penalties (iii) list of common debris sites, transit sites and processing facilities, (iv) incentives for use of recycled material etc.

## MONITORING SYSTEM

Key aspects to be monitored:



## ROLES AND RESPONSIBILITIES



## GRIEVANCE REDRESSAL MECHANISM

Efficient complaint redressal system creates a platform for various stakeholders to voice their complaints and is an additional monitoring mechanism for the ULB.

Complaints - walk-in complaints, phone calls, SMS, online complaints, through postal service etc.

Efficient and timely grievance redressal considering type of grievance, problem caused, remedial action

Area-wise periodic (daily, weekly or monthly) report which includes number and type of complaints received, action taken including time taken, feedback of the complainant and pending complaints.

Report submitted to Chief Executive officer or Commissioner of ULB.

The details of complaints received and action taken should also be available on the ULB website and its office during working hours

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**Thank you.**



## Online Training on “Phytoremediation”

(Funded by Directorate of Municipal Administration (DMA), Government of Karnataka)

Sl.No	Date	Topic	Resource Person	ULB's covered	No.of participants	Remarks
1	18-11-2020	Introduction to Phyto Remediation	Dr. Suma, Assistant Professor, m College of Agriculture Raichur	Selected 42 ULB's	85	
2	21-112020	Bio- Remediation	Dr. Raju. N S, Professor & Head, Department of Environmental Science, Manasagangotri, University of Mysore, Mysore	Selected ULB's	22	
3	22.12.2020	Phytoremediation	Dr. Raju. N S, Professor & Head, Department of Environmental Science, Manasagangotri, University of Mysore, Mysore	Kanakapura, Ramanagera, Davanagere, Harihara, Honnali, Shivamogga, Bhadravathi, Hunsur CMC, Nanjanagudu CMA, Bannur TMC, T Narasipura, TMC Maddur, TMC SRPatna, Kollegal, Hassan, Belur, Bantawl, Belthangady, Shahabad, Jewargi, Saundatti, Ramdurg, ikkodi, Khanapur, Sadalaga, m	54	42 selected ULB's covered

4	21-01-2021	Phytoremediation	Dr. Suma, Assistant Professor, m College of Agriculture Raichur	Kudachi, Ugarkhurd, Munavalli, hichali, Ainapur, EXamba, MKhubli, Rabakavi banahatti, terradal, CMC Ranebennur, Karwar, Dandeli, Hoovina Hadagali, BBMP	18	07 selected ULB's covered	
5	16-02-2021	Phytoremediation	National Environment Engineering Research Institute	Selected 42 ULB's	42		
6	19-02-2021	Phytoremediation	Dr. Raju. N S, Professor & Head, Department of Environmental Science, Manasagangotri, University of Mysore, Mysore	Maddur, TMC SRPatna, Kollegal, Hassan, Belur	17		
7	26-02-2021	Phytoremediation	Mr. Laxmikanth Environmental Officer , Udupi, Karnataka State pollution Control Board	Saundatti, Randurg, ikkodi, Khanapur, Sadalaga, m Kudachi, Ugarkhurd, Munavalli, hichali, Ainapur, EXamba, MKhubli,	17		
8	27-04-2021	Phytoremediation	Mr. Laxmikanth Environmental	Rabakavi banahatti, terradal, CMC Ranebennur, Karwar,	13		

		Officer , Karnataka pollution Board	Udupi, State Control	Dandeli, Hoovina Hadagali, BBMP		
Total					08 trainings	268 participants



**Proceedings of the 7<sup>th</sup> State Level Advisory Body meeting held on 25-09-2020 at 3:00 pm in room no 422 under the Chairmanship of Additional Chief Secretary, Urban Development Department, GoK**

List of Officers present is enclosed as **Annexure-1**.

The Director, DMA welcomed the Chair person & members of the **State Level Advisory Body (SLAB)** meeting. It was brought to the notice of the Committee that the said meeting has been convened to accord approval to **SWM State Policy & Strategy** prepared as per the provisions of Rule 11 (a), (b) & (c) of Solid Waste Management Rules 2016.

It was briefed to the Committee that the draft SWM State policy and strategy was previously prepared by "SAHAAS Waste Management Pvt Ltd" and was presented in 4 divisional level consultative meetings & 7 stake holder consultation meetings held at BBMP. As per the decision in 3<sup>rd</sup> SLAB meeting, due to conflict of interest, it was decided to discontinue the services of SAHAAS; instead State Level Advisory Committee (SLAC) & Executive Committee were newly constituted for formulating SWM Policy and Strategy. The SLAC has met on several occasions and provided necessary inputs, shared relevant literature and based on these details, Executive Committee involving relevant officials from various line Departments has finalised the current policy and strategy. Hon'ble High Court in WP No. 24739-24740/2012 has given directive to State to finalise the Policy.

It was observed that the **Urban Solid Waste Management policy-2020** broadly covers Applicability, Vision, Objective, Guiding Principles and has proposed specific policy initiatives for different waste streams, generators and other aspects. **The Urban Solid Waste Management Strategy-2020** covers Key Principles for solid waste management, typical flow of solid waste, Governance of solid waste management systems, Role and Management of labour in solid waste management, decentralised waste management systems with an option to review and amend the Policy & Strategy atleast every two years or earlier if deemed necessary by the Government. 10 Annexures have been annexed to the strategy document which are as detailed below:

**Annexure A:** Appropriate planning, developing institutional mechanisms and financial guidelines for solid waste management,

**Annexure B:** Wet waste (biodegradable waste) management strategy

**Annexure C:** Dry waste management strategy

**Annexure D:** Domestic hazardous waste, sanitary waste management and special wastes strategy

**Annexure E:** Monitoring and evaluation of solid waste management system

**Annexure F:** Street sweeping in ULBs.

**Annexure G:** G on setting up and operating a sanitary landfill and options for legacy waste, dumpsite management

**Annexure H:** Public information, education and communication

**Annexure I:** Safeguarding health, welfare and dignity of pourakarmikas and other sanitary workers

**Annexure J:** Integration of the informal waste sector into solid waste management systems

The State Policy and Strategy were discussed in length. The Committee members suggested incorporation of additional issues such as promotion of "Namma Kasa Namma Javabdari" to encourage home composting, revision of normative standards, linkage of biometric with salary payment, non diversion of funds earmarked for SWM, free access to public toilets by pourakarmikas, need for rest rooms, creation of Internal Complaint Committee in all ULBs etc, duly noted in **Annexure-2**.

The Committee approved the Policy, observing that the policy in its present form is an all inclusive document covering all aspects of SWM Rules. The Chairperson directed that the members not present for the meeting may be given additional time to provide their valuable feedback on the proposed policy. Due to paucity of time, they may be requested to submit their comments/inputs on the proposed copy circulated by 28-09-2020. If no comments are received it would be presumed that proposed policy is agreeable. Any comments received within the stipulated time may be duly considered if within the scope of SWM rules and final copy submitted to Government.

The Director, DMA presented Solid Waste Management & Plastic Waste Management implementation status in the State (excluding BBMP). Chairperson observed that State has to improve its performance in source segregation, processing & disposal of solid waste & that tempo of implementation of plastic ban has to be reawakened in its true spirit. He further opined that since Hon'ble NGT is following implementation of SWM Rules, PWM Rules 2016 and C&D Management Rules meticulously, State has to have a proper road map to achieve the stipulated targets by 31-3-2021.

Finally, it was resolved to acknowledge the efforts made by Sri Anjum Parwez, previous Principal Secretary UDD, Sri Randeep, Special Commissioner (SWM), BBMP and the indispensable contribution of Smt. Almitra Patel, Sri Leo Saldhana, Smt. Nalini Shekhar, Smt. Sandhya Narayan, Sri Ramakanth, Smt. Kathyayini Chamaraj, Ms. Pinky Chandran, Sri Clifton Rozario, Smt. Mythreyi and all other members of the Advisory Committee and Executive Committee in framing the SWM Policy and Strategy.

The meeting concluded with vote of thanks to the Chair.



**Rakesh Singh, IAS**  
Additional Chief Secretary  
Urban Development Department  
Vikasa Soudha, Bangalore



**Proceedings of the 8<sup>th</sup> State Level Advisory Body meeting held on 12-3-2021 at 3:00 pm in room no 422 under the Chairmanship of Additional Chief Secretary, Urban Development Department, GoK**

List of Officers present is enclosed as Annexure-1

The Director, DMA welcomed the Chair person & members for the 8<sup>th</sup> State Level Advisory Body (SLAB) meeting. The Director, DMA presented Solid Waste Management & Plastic Waste Management implementation status in ULB. It was brought to the notice of the Committee that the said meeting has been convened as per the mandate given in GO UDD 267 CSS2016, dated 7-11-2016, which states that SLAB has to meet biannually to review the implementation status of waste management and issue guidance/ directions to ensure 100% compliance.

The Committee discussed the status of dry waste management in ULBs. It was observed that around 643 tonnes (5.8% of total waste generation) of dry waste is being recycled and that 114 tonnes of RDF was sent to cement kiln during the year 2019-20. Smt. Nalini Shekar from Hasirudala informed that aggregation centres are required in major cities/ district head quarters to store the non-recyclable dry waste-predominately RDF material from where it can be transported to nearby cement factories. SEO of KSPCB informed that in BBMP, high calorific value dry waste/RDF is left unattended some time due to high cost involved in transportation of RDF to nearby cement factories. CE, BBMP informed that as per CPCB guidelines up to 200 km, Cement factories need to lift the RDF free of cost from ULBs, since the nearby cement factory to Bangalore is around 450 km, cement factories are seeking Rs.20, 000/tonne of RDF transportation and presence of moisture and silt has made them reluctant to come forward. Smt. Sandya Narayanan informed that EPR has to be effectively utilised and Government should direct companies/industry to involve in dry waste management as par with plastic waste generated.

Principal Secretary, UDD observed that a focused approach might yield better results. Accordingly it was decided to constitute 3 working groups involving SLAB members and SPCB as follows.

1. **Working group to be constituted for North Karnataka Districts** including Dharwad, Kalburgi, Vijayapura and Bagalkote districts which have cement

factories located within 200 km radius. Commissioners Kalburgi CC and Dharwad CC be involved so that RDF generated in the entire region reaches the cement kiln.

2. **A working group for BBMP and ULBs around Bangalore.** This to be headed by Special Commissioner (SWM), BBMP. This cluster should work out modalities to transport RDF to nearby cement factories till BBMP-KPCL waste to energy plant commissioned at Bidadi.
3. **Third working group to be formed for coastal region of Dakshina kannada (DK), Uttar kannada (UK)** including eco-sensitive areas such as Coorg district. The group can rely on the successful waste management model of Uattara kannada District.
4. It was decided to map all the districts to the available cement kilns by taking note of the available quantity of RDF in ULBs and capacity of the kilns in processing the same.
5. It was decided to invite companies/brand owners & cement factories under Extended Producers Responsibility [EPR] for a meeting under the chairmanship of Additional Chief Secretary (ACS), Urban Development Department for which Additional Chief Secretary, Industries and Commerce department and Additional Chief Secretary Ecology, Environment & Forest department may be invited to explore and to discuss the modalities to dispose RDF and modalities for implementing EPR.
6. Additional Chief Secretary, UDD requested the two non-official members to prepare a working note spelling out the way forward in implementing EPR effectively to facilitate the discussion with manufacturers.
7. SEO, KSPCB informed that draft gazette has been published by CPCB to ban Single Use Plastic (SUP) across the nation which will solve the problem of illegal transportation of banned plastic items from one State to another. Committee felt in the wake of COVID, rigorous implementation of the ban has to happen as plastic use has increased.
8. It was decided to form a working group under the Chairmanship of working Director, DMA for working out the modalities for implementation of new schemes announced under SBM(U) in 2021-22 budget speech, such as

establishment of MRF facilities in 5 Corporations, 30 Swachh Gruha Kalika Kendra in district headquarters and Community composting in 59 CMCs and Corporations.

The Chairperson observed that the Committee can meet regularly in the wake of NGT orders requiring rigorous implementation of SWM Rules 2016 and to ensure ULBs are adhering to the timeline given to NGT for various milestones.

The meeting ended with vote of thanks to the Chair.



Rakesh Singh, IAS  
Additional Chief Secretary  
Urban Development Department  
Vikasa Soudha, Bangalore





**PROCEEDINGS OF THE GOVERNMENT OF KARNATAKA**

**Subject:** Constitution of the Special Task Force for taking measures to eliminate single use plastic in the State of Karnataka.

- Reference:** 1) Plastic Waste Management Rules, 2016 notified by Ministry of Environment, Forest and Climate Change on 18-03-2016.
- 2) Plastic Ban Notification No. FEE 17 EPC 2012, dated 11-03-2016 issued by Forest, Environment and Ecology Department, Govt. of Karnataka.
- 3) Office Memorandum F.No. 17/6/2021-HSM, dated: 16-04-2021 issued by Ministry of Environment, Forest and Climate Change, Govt. of India.

\*\*\*\*\*

**PREAMBLE:**

Vide reference (1) above, the Ministry of Environment, Forest and Climate Change has notified the Plastic Waste Management Rules, 2016 prohibiting plastic carry bags less than 50 microns and clearly defining the roles and responsibilities of various stakeholders including Urban Local Bodies in handling the plastic wastes in a systematic and environmental friendly manner.

Vide reference (2) above, the Department of Forest, Environment and Ecology, Govt. of Karnataka has notified the ban on selling and usage of all types of plastic carry bags, plastic banners, plastic buntings, flex, plastic flags, plastic plates, plastic cups & spoons, plastic sheets spread on dining table, thermocol across the State.

In the Office Memorandum at reference (3) above, the Ministry of Environment, Forest and Climate Change, Govt. of India (MoEFCC), as per the decision taken in the PRAGATI meeting held by Hon'ble Prime Minister on 24<sup>th</sup> January 2021, has requested the State Government to constitute a Special Task Force under the Chairmanship of Chief Secretary /Administrator for preparing a comprehensive action plan for elimination of single use plastics (SUPs) and implementation of Plastic Waste Management Rules, 2016 (PWMR) and implementing it in mission mode. To facilitate the constitution of Task Force, the MoEFCC has provided an indicative composition of the Special Task Force and the Terms of Reference.

As per the recommendations of MoEFCC, the State Government has decided to constitute a Special Task Force, hence the following Order: 

**Government Order No: UDD 93 CSS 2021,**  
**Bengaluru, Dated: 24-05-2021.**

Under the circumstances explained in the Preamble, the Government is pleased to constitute a State Level Special Task Force under the Chairmanship of Additional Chief Secretary to Govt. of Karnataka for preparing a comprehensive action plan for elimination of single use plastics and implementation of Plastic Waste Management Rules, 2016 and implementing it in mission mode.

**A. Composition of the State Level Special Task Force is as follows:**

1	Additional Chief Secretary to Government	<b>Chairman</b>
2	Additional Chief Secretary, Urban Development Department	Member
3	Principal Secretary/Secretary, Urban Development Department	Member
4	Additional Chief Secretary/Principal Secretary, Rural Development Department	Member
5	Additional Chief Secretary/Principal Secretary, Panchayat Raj Department	Member
6	Additional Chief Secretary/Principal Secretary, Department of Industries and Commerce	Member
7	Additional Chief Secretary/Principal Secretary, Skill Development, Entrepreneurship and Livelihood Department	Member
8	Additional Chief Secretary/Principal Secretary, Forest, Ecology and Environment Department	Member
9	Additional Chief Secretary/Principal Secretary, Primary and Secondary Education Department	Member
10	Additional Chief Secretary/Principal Secretary, Higher Education Department	Member
11	Additional Chief Secretary/Principal Secretary, Science & Technology Department	Member
12	Additional Chief Secretary/Principal Secretary, Youth Empowerment & Sports Department	Member
13	Commissioner / Director, Information and Public Relations Department	Member
14	Director, Directorate of Municipal Administration and State Coordinator for Swachh Bharat Mission 2.0 (Urban)	Member
15	The Commissioner, Rural Drinking water and Sanitation Department and Coordinator for Swachh Bharat Mission 2.0 (Gramin)	Member
16	Member Secretary, Karnataka State Pollution Control Board	<b>Member Convener</b>

- The meetings of Task Force will be convened once in two months.
- The Chairperson may co-opt members as required.

**B. Nodal Department:**

The State Government designates the Directorate of Municipal Administration as the nodal department for urban areas and Rural Drinking water and Sanitation Department as nodal Department for Rural areas.

**C. For effective implementation on the ground, District / City Level Task Force has been constituted as under;**

**For Million Plus Cities (BBMP):** City Level Task Force under Chief Commissioner of Bruhat Bengaluru Mahanagara Palike.

**For Districts (excluding BBMP):** District Level Task Force under Deputy Commissioners.

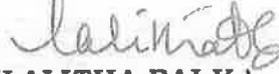
**D. Terms of Reference for State Level Special Task Force:**

1. Prepare a comprehensive Action Plan for implementation of Plastic Waste Management Rules, 2016 and phasing out of single use plastics, with identified activities and timelines and synergizing efforts and resources of various Departments / Agencies at State, District and City level.
2. Assess plastic waste generated in State with respect to collection, recycling and end of life disposal and identify gaps in plastic waste management (Reduce, Reuse and Recycle) - policy, implementation, enforcement, infrastructure etc.
3. Strengthen policy, regulatory, institutional mechanisms/structures for the implementation of Plastic Waste Management Rules, 2016 and phasing out of Single Use Plastic in the State, design appropriate management strategies and allow for allocation of financial resources for PWM including leveraging of funds from Swachh Bharat Mission.
4. Take measures for effective enforcement of (i) Plastic Waste Management Rules, 2016, as amended, and (ii) State specific bans imposed on identified single use plastic items.
5. Develop policies for supporting the adoption of alternatives to identified single use plastic items prohibited under PWMR, 2016, as amended.
6. Take measures to strengthen ULBs/GPs for segregation, collection, storage, transportation, processing and disposal of plastic waste.
7. Take measures for effective monitoring of implementation of PWM Rules, 2016, as amended.
8. Prepare a detailed road map for activities to build awareness and outreach among public on plastic waste management and reduction in the use of SUP items.



9. Develop strategy for building a strong public movement for mitigation of plastic pollution by involving education institutions (schools, colleges and universities), NCC, NSS, Scouts, Youth clubs, Eco clubs, Opinion makers and voluntary organizations with a detailed action plan in this regard.

By Order and in the Name of  
the Governor of Karnataka,

  
(LALITHA BAI K.)

Under Secretary to Government (PMU),  
Urban Development Department.

To: The Compiler, Karnataka Gazette for publication in the next issue of Gazette

**Copy to:**

1. The Accountant General (Accounts & Entitlement), Karnataka, Bengaluru.
2. The Accountant General (G&SSA), Karnataka, Bengaluru.
3. The Chief Secretary, Government of Karnataka, Vidhana Soudha, Bengaluru.
4. The Secretary, MoEFCC, Government of India, New Delhi.
5. The Additional Chief Secretary/Principal Secretary to Govt., Urban Development Department, Vikasa Soudha, Bengaluru.
6. Additional Chief Secretary/Principal Secretary to Govt, RDPR Dept, M.S. Building, Bengaluru.
7. Additional Chief Secretary/Principal Secretary to Govt, Department of Industries and Commerce, Bengaluru.
8. Additional Chief Secretary/Principal Secretary to Govt., Skill Development, Entrepreneurship and Livelihood Department, Bengaluru.
9. Additional Chief Secretary/Principal Secretary to Govt., Forest, Environment and Ecology Dept, M.S. Building, Bengaluru.
10. Additional Chief Secretary/Principal Secretary to Govt., Primary and Secondary Education Department, Bengaluru.
11. Additional Chief Secretary/Principal Secretary to Govt., Higher Education Department, Bengaluru.
12. Additional Chief Secretary/Principal Secretary to Govt., Science & Technology Department, Bengaluru.
13. Additional Chief Secretary/Principal Secretary to Govt., Youth Empowerment & Sports Department, Bengaluru.
14. Commissioner / Director, Information and Public Relations Department, Bengaluru.
15. Chief Commissioner, Bangalore Mahanagara Palike, Bengaluru.
16. Director, Directorate of Municipal Administration, Bengaluru.
17. Commissioner, Rural Drinking water and Sanitation Department, Bengaluru.
18. Member Secretary, Karnataka State Pollution Control Board, Bengaluru.
19. Deputy Commissioners of all Districts through DMA.
20. Commissioners of all Corporations through DMA.
21. Municipal Commissioners of all CMCs through DMA.
22. Chief Officers – all TMCs/TPs & NACs through DMA.
23. Joint Secretary to Govt., Urban Development Department.
24. Deputy Secretary to Govt. – 1, 2 and 4, Urban Development Department.
25. PS to Additional Chief Secretary to Hon'ble Chief Minister
26. PS to the Hon'ble Minister for Municipal Administration, Hon'ble Minister for Urban Development.
27. Spare Copies / Section Guard File.

**Details of Plastic Prohibition Penalty (City Corporations)**  
**The Karnataka Municipal Corporations (excluding BBMP) Solid**  
**Waste Management Model Bye Laws 2019**

SI No	Neglecting and Waste water	Rs in lakhs		
		First time penalty	Second time penalty	Third time penalty
1	Sale of banned plastic materials	500	1000	Cancellation and prosecution of a business license
2	Illicit Stock of banned plastic materials			
	If <1 Kg	500	1000	
	If 1 to 10 Kg	2000	5000	
	If 10 to 50 Kg	5000	10000	
	If 50 to 100 Kg	10000	20000	
	If >100 Kg	40000	50000	
3	Illicit use of banned plastic materials	Rs.20	Rs.50	Rs.75

**Details of Plastic Prohibition Penalty (Urban Local bodies)**  
**The Karnataka Municipalities Solid Waste Management Model Bye**  
**Laws 2019**

SI No	Neglecting and Waste water	Rs in lakhs				Third time penalty
		First time penalty		Second time penalty		
		CMC	TMC/TP	CMC	TMC/TP	
1	Sale of banned plastic materials	100	50	200	100	Cancellation and prosecution of a business license
2	Illicit Stock of banned plastic materials					
	If <1 Kg	200	100	500	200	
	If 1 to 10 Kg	500	200	1000	500	
	If 10 to 50 Kg	1000	500	2000	1000	
	If 50 to 100 Kg	2000	1000	5000	2000	
	If >100 Kg	5000	2000	10000	5000	
3	Illicit use of banned plastic materials	Rs.15	Rs.10	Rs.30	Rs.25	Rs.50



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Su 7



**ಕರ್ನಾಟಕ ಸರ್ಕಾರ**

ಸಂಖ್ಯೆ: ನಅಇ 345 ಸಿಎಸ್‌ಎಸ್ 2020

ಕರ್ನಾಟಕ ಸರ್ಕಾರದ ಸಚಿವಾಲಯ,  
ವಿಕಾಸ ಸೌಧ.  
ಬೆಂಗಳೂರು, ದಿನಾಂಕ: 09-06-2021

**ಸೇರ್ಪಡೆ ಆದೇಶ**

ನಿರ್ದೇಶಕರು, ಪೌರಾಡಳಿತ ನಿರ್ದೇಶನಾಲಯ ರವರು, ಪತ್ರ ಸಂಖ್ಯೆ: 24452/ಪೌನಿ/3/ಫವನಿ/2014-15, ದಿನಾಂಕ: 20-04-2021 ರಲ್ಲಿ ಕೋರಿರುವಂತೆ, ಸರ್ಕಾರದ ಆದೇಶ ಸಂಖ್ಯೆ: UDD 90 CSS 2018, ದಿನಾಂಕ: 09-10-2019ರನ್ವಯ ರಾಜ್ಯ ಪತ್ರದಲ್ಲಿ ಪ್ರಕಟಿಸಲಾದ ಕರ್ನಾಟಕ ಪೌರಸಭೆಗಳ ಘನ ತ್ಯಾಜ್ಯ ನಿರ್ವಹಣಾ ಮಾದರಿ ಉಪನಿಯಮಗಳು 2019ರ ಅನುಸೂಚಿ-VIII ರಲ್ಲಿ ಈಗಾಗಲೇ ಲಭ್ಯವಿರುವ ದಂಡ/ಬುಲ್ಡಾನ್ ವರ್ಗಗಳ ಜೊತೆಗೆ, ನಿಷೇಧಿತ ಪ್ಲಾಸ್ಟಿಕ್ ಸಾಮಗ್ರಿಗಳ ಅಕ್ರಮ ಮಾರಾಟ, ದಾಸ್ತಾನು ಸಂಗ್ರಹಣೆ ಹಾಗೂ ಬಳಕೆ ಕುರಿತಂತೆ ಈ ಕೆಳಕಂಡ ದಂಡಗಳನ್ನು ಸೇರ್ಪಡಿಸಿ ಆದೇಶಿಸಿದೆ.

(ರೂ.ಗಳಲ್ಲಿ)

ಕ್ರ. ಸಂ.	ಪಾಲನೆ ಮಾಡದಿರುವಿಕೆ ಮತ್ತು ತ್ಯಾಜ್ಯೋತ್ಸಾದಕರ ವಿಧಿ	ದಂಡ ಮೂದಲನೇ ಅಪರಾಧಕ್ಕೆ		ದಂಡ ಎರಡನೇ ಅಪರಾಧಕ್ಕೆ		ದಂಡ ಮೂರನೇ ಅಪರಾಧಕ್ಕೆ	
		ನಗರಸಭೆ	ಪುರಸಭೆ/ಪಟ್ಟಣ ಪಂಚಾಯತಿ	ನಗರಸಭೆ	ಪುರಸಭೆ/ಪಟ್ಟಣ ಪಂಚಾಯತಿ	ನಗರಸಭೆ	ಪುರಸಭೆ/ಪಟ್ಟಣ ಪಂಚಾಯತಿ
13	ಅ) ನಿಷೇಧಿತ ಪ್ಲಾಸ್ಟಿಕ್ ಸಾಮಗ್ರಿಗಳ ಮಾರಾಟ	100	50	200	100	ಉದ್ದಿಮೆ ಪರವಾನಗಿಯನ್ನು ರದ್ದುಗೊಳಿಸುವುದು ಹಾಗೂ ಕಾನೂನಾತ್ಮಕ ಕ್ರಮ ಕೈಗೊಳ್ಳುವುದು	
	ಆ) ನಿಷೇಧಿತ ಪ್ಲಾಸ್ಟಿಕ್ ಸಾಮಗ್ರಿಗಳ ಅಕ್ರಮ ದಾಸ್ತಾನು						
	If < 1kg	200	100	500	200		
	If >1 upto 10kg	500	200	1000	500		
	If >10 upto 50kg	1000	500	2000	1000		
	If >50 upto 100kg	2000	1000	5000	2000		
	If > 100kg	5000	2000	10000	5000		
ಇ) ನಿಷೇಧಿತ ಪ್ಲಾಸ್ಟಿಕ್ ಸಾಮಗ್ರಿಗಳ ಅಕ್ರಮ ಬಳಕೆ	15	10	30	25	50		

10/6

Directorate of Municipal Administration  
11 JUN 2021  
HQA/AD, Admin  
D/A

ಕರ್ನಾಟಕ ರಾಜ್ಯಪಾಲರ ಆಜ್ಞಾನುಸಾರ ಮತ್ತು ಅವರ ಹೆಸರಿನಲ್ಲಿ,  
**ಲಲಿತಾಬಾಯಿ ಕೆ.**  
(ಲಲಿತಾಬಾಯಿ ಕೆ.)  
ಸರ್ಕಾರದ ಅಧೀನ ಕಾರ್ಯದರ್ಶಿ(ಯೋಜನೆ/ಕೋ),  
ನಗರಾಭಿವೃದ್ಧಿ ಇಲಾಖೆ.

16/6  
ಚಿ.ಕೆ.ಎ

- ಗೆ:
- 1) ನಿರ್ದೇಶಕರು, ಪೌರಾಡಳಿತ ನಿರ್ದೇಶನಾಲಯ, ಬೆಂಗಳೂರು
  - 2) ಎಲ್ಲಾ ಜಿಲ್ಲಾಧಿಕಾರಿಗಳು - ಪೌ.ನಿ. ಮೂಲಕ.

- 3) ಪೊರಾಯ್ಕೆರು, ರಾಜ್ಯದ ಎಲ್ಲಾ ನಗರಸಭೆಗಳು - ಪೊ.ನಿ.ಮೂಲಕ.
- 4) ಮುಖ್ಯಾಧಿಕಾರಿಗಳು, ರಾಜ್ಯದ ಎಲ್ಲಾ ಪುರಸಭೆಗಳು / ಐಟಿಐಐ ಪಂಚಾಯತಿಗಳು/ NAC ಗಳು - ಪೊ.ನಿ.ಮೂಲಕ.
- 5) ಸದಸ್ಯ ಕಾರ್ಯದರ್ಶಿ, ಕರ್ನಾಟಕ ರಾಜ್ಯ ಮೂಲನೈ ನಿಯಂತ್ರಣ ಮಂಡಳಿ, ಬೆಂಗಳೂರು.

ಹೆಚ್ಚಿ:

- 1) ಸರ್ಕಾರದ ಅಪರ ಮುಖ್ಯ ಕಾರ್ಯದರ್ಶಿಯವರ ಆ.ಕಾ. ರವರಿಗೆ, ನಗರಾಭಿವೃದ್ಧಿ ಇಲಾಖೆ.
- 2) ಸರ್ಕಾರದ ಅಪರ ಮುಖ್ಯ ಕಾರ್ಯದರ್ಶಿಯವರ ಆ.ಕಾ. ರವರಿಗೆ, ಆರ್ಥಿಕ ಇಲಾಖೆ.
- 3) ಸರ್ಕಾರದ ಪ್ರಧಾನ ಕಾರ್ಯದರ್ಶಿಯವರ ಆ.ಕಾ. ರವರಿಗೆ, ನಗರಾಭಿವೃದ್ಧಿ ಇಲಾಖೆ.
- 4) ಸರ್ಕಾರದ ಜಂಟಿ ಕಾರ್ಯದರ್ಶಿಯವರ ಆ.ಸ. ರವರಿಗೆ, ನಗರಾಭಿವೃದ್ಧಿ ಇಲಾಖೆ.
- 5) ಜಂಟಿ ನಿರ್ದೇಶಕರು (ಯೋ) ರವರ ಆ.ಸ. ರವರಿಗೆ, ನಗರಾಭಿವೃದ್ಧಿ ಇಲಾಖೆ.
- 6) ಸರ್ಕಾರದ ಉಪ ಕಾರ್ಯದರ್ಶಿ - 1, 2 & 3 ರವರ ಆ.ಸ. ರವರಿಗೆ, ನಗರಾಭಿವೃದ್ಧಿ ಇಲಾಖೆ.



**ಕರ್ನಾಟಕ ಸರ್ಕಾರ**

ಸಂಖ್ಯೆ: ನಅಇ 345 ಸಿಎಸ್‌ಎಸ್ 2020

ಕರ್ನಾಟಕ ಸರ್ಕಾರದ ಸಚಿವಾಲಯ,  
ವಿಕಾಸ ಸೌಧ.

ಬೆಂಗಳೂರು, ದಿನಾಂಕ: 09-06-2021

**ಸೇರ್ಪಡೆ ಆದೇಶ**

ನಿರ್ದೇಶಕರು, ಪೌರಾಡಳಿತ ನಿರ್ದೇಶನಾಲಯ ರವರು, ಪತ್ರ ಸಂಖ್ಯೆ: 24452/ಪೌನಿ/3/ಫವನಿ/2014-15, ದಿನಾಂಕ: 20-04-2021 ರಲ್ಲಿ ಕೋರಿರುವಂತೆ, ಸರ್ಕಾರದ ಆದೇಶ ಸಂಖ್ಯೆ: **UDD 90 CSS 2018**, ದಿನಾಂಕ: **09-10-2019**ರನ್ವಯ ರಾಜ್ಯ ಪತ್ರದಲ್ಲಿ ಪ್ರಕಟಿಸಲಾದ ಕರ್ನಾಟಕ ನಗರಪಾಲಿಕೆಗಳ (ಬಿ.ಬಿ.ಎಂ.ಪಿ. ಹೊರತುಪಡಿಸಿ) ಘನ ತ್ಯಾಜ್ಯ ನಿರ್ವಹಣಾ ಮಾದರಿ ಉಪನಿಯಮಗಳು 2019ರ ಅನುಸೂಚಿ-VIII ರಲ್ಲಿ ಈಗಾಗಲೇ ಲಭ್ಯವಿರುವ ದಂಡ/ಜುಲ್ಮಾನೆ ವರ್ಗಗಳ ಜೊತೆಗೆ, ನಿಷೇಧಿತ ಪ್ಲಾಸ್ಟಿಕ್ ಸಾಮಗ್ರಿಗಳ ಅಕ್ರಮ ಮಾರಾಟ, ದಾಸ್ತಾನು ಸಂಗ್ರಹಣೆ ಹಾಗೂ ಬಳಕೆ ಕುರಿತಂತೆ ಈ ಕೆಳಕಂಡ ದಂಡಗಳನ್ನು ಸೇರ್ಪಡಿಸಿ ಆದೇಶಿಸಿದೆ.

(ರೂ.ಗಳಲ್ಲಿ)

ಕ್ರ. ಸಂ.	ಪಾಲನೆ ಮಾಡದಿರುವಿಕೆ ಮತ್ತು ತ್ಯಾಜ್ಯೋತ್ಪಾದಕರ ವಿಧಿ	ದಂಡ ಮೊದಲನೇ ಅಪರಾಧಕ್ಕೆ	ದಂಡ ಎರಡನೇ ಅಪರಾಧಕ್ಕೆ	ದಂಡ ಮೂರನೇ ಅಪರಾಧಕ್ಕೆ
13	ಅ) ನಿಷೇಧಿತ ಪ್ಲಾಸ್ಟಿಕ್ ಸಾಮಗ್ರಿಗಳ ಮಾರಾಟ	500	1,000	ಉದ್ದಿಮೆ ಪರವಾನಗಿಯನ್ನು ರದ್ದುಗೊಳಿಸುವುದು ಹಾಗೂ ಕಾನೂನಾತ್ಮಕ ಕ್ರಮ ಕೈಗೊಳ್ಳುವುದು
	ಆ) ನಿಷೇಧಿತ ಪ್ಲಾಸ್ಟಿಕ್ ಸಾಮಗ್ರಿಗಳ ಅಕ್ರಮ ದಾಸ್ತಾನು			
	If < 1kg	500	1,000	
	If > 1 upto 10kg	2,000	5,000	
	If > 10 upto 50kg	5,000	10,000	
	If > 50 upto 100kg	10,000	20,000	
	If > 100kg	40,000	50,000	
	ಇ) ನಿಷೇಧಿತ ಪ್ಲಾಸ್ಟಿಕ್ ಸಾಮಗ್ರಿಗಳ ಅಕ್ರಮ ಬಳಕೆ	20	50	75

ಕರ್ನಾಟಕ ರಾಜ್ಯಪಾಲರ ಆಜ್ಞಾನುಸಾರ ಮತ್ತು  
ಅವರ ಹೆಸರಿನಲ್ಲಿ,

(ಲಲಿತಾಚಾರ್ಯ ಕೆ.)

ಸರ್ಕಾರದ ಅಧೀನ ಕಾರ್ಯದರ್ಶಿ (ಯೋಜನೆ/ಕೋ),  
ನಗರಾಭಿವೃದ್ಧಿ ಇಲಾಖೆ.

ಗೆ;

- 1) ನಿರ್ದೇಶಕರು, ಪೌರಾಡಳಿತ ನಿರ್ದೇಶನಾಲಯ, ಬೆಂಗಳೂರು
- 2) ಸಂಬಂಧಿಸಿದ ಜಿಲ್ಲಾಧಿಕಾರಿಗಳು - ಪೌ.ನಿ. ಮೂಲಕ.

- 3) ಆಯುಕ್ತರು, ರಾಜ್ಯದ ಎಲ್ಲಾ ಮಹಾನಗರಪಾಲಿಕೆಗಳು (ಬಿಬಿಎಂಪಿ ಹೊರತುಪಡಿಸಿ) - ಪೌ.ನಿ. ಮೂಲಕ.
- 4) ಸದಸ್ಯ ಕಾರ್ಯದರ್ಶಿ, ಕರ್ನಾಟಕ ರಾಜ್ಯ ಮಾಲಿನ್ಯ ನಿಯಂತ್ರಣ ಮಂಡಳಿ, ಬೆಂಗಳೂರು.

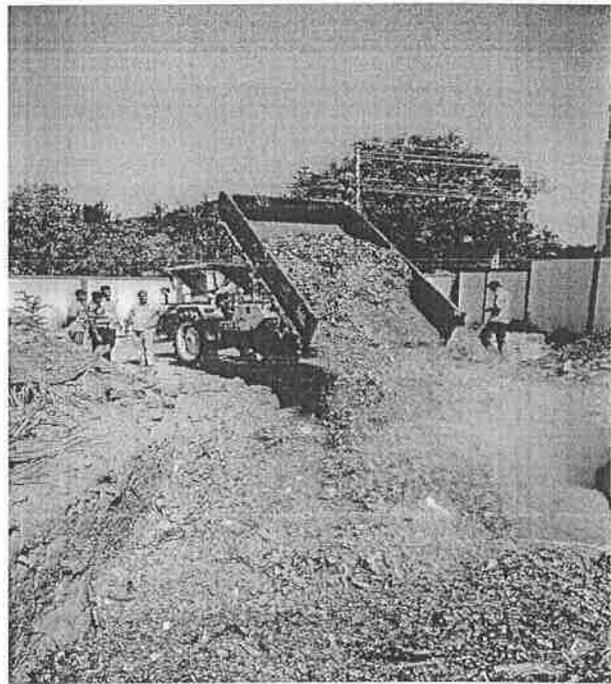
**ಪ್ರತಿ:**

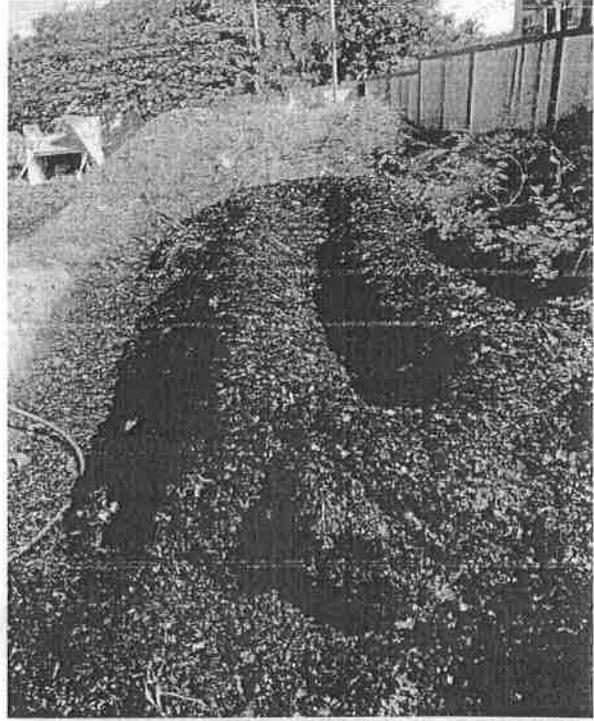
- 1) ಸರ್ಕಾರದ ಅಪರ ಮುಖ್ಯ ಕಾರ್ಯದರ್ಶಿಯವರ ಆ.ಕಾ. ರವರಿಗೆ, ನಗರಾಭಿವೃದ್ಧಿ ಇಲಾಖೆ.
- 2) ಸರ್ಕಾರದ ಅಪರ ಮುಖ್ಯ ಕಾರ್ಯದರ್ಶಿಯವರ ಆ.ಕಾ. ರವರಿಗೆ, ಆರ್ಥಿಕ ಇಲಾಖೆ.
- 3) ಸರ್ಕಾರದ ಪ್ರಧಾನ ಕಾರ್ಯದರ್ಶಿಯವರ ಆ.ಕಾ. ರವರಿಗೆ, ನಗರಾಭಿವೃದ್ಧಿ ಇಲಾಖೆ.
- 5) ಸರ್ಕಾರದ ಜಂಟಿ ಕಾರ್ಯದರ್ಶಿಯವರ ಆ.ಸ. ರವರಿಗೆ, ನಗರಾಭಿವೃದ್ಧಿ ಇಲಾಖೆ.
- 4) ಜಂಟಿ ನಿರ್ದೇಶಕರು (ಯೋ) ರವರ ಆ.ಸ. ರವರಿಗೆ, ನಗರಾಭಿವೃದ್ಧಿ ಇಲಾಖೆ.
- 5) ಸರ್ಕಾರದ ಉಪ ಕಾರ್ಯದರ್ಶಿಯವರ ಆ.ಸ. ರವರಿಗೆ, ನಗರಾಭಿವೃದ್ಧಿ ಇಲಾಖೆ (ಮ.ಪಾ-2).

## Decentralised community Waste Management at Davangere CC

S.I no	Details of decentralised wet waste management at Davangere CC	
1	Quantity of waste (TPD)	0.5
2	Type of waste processed	Fallen Dry Leaves
3	Technology adopted	Pit Composting – Fallen dry leaves collected from streets is transported to site and dumped in pit. Watering & turning over is done once in a week for 3 months till compost is ready for use.
4	Infrastructure required (Name of the components)	Refer Below
	Civil works	<ol style="list-style-type: none"> <li>1. Open shed of 15 ft x 20 ft for storing ready compost.</li> <li>2. Water supply connection for composting process.</li> <li>3. Electricity connection for shredder.</li> </ol>
	Machineries	<ol style="list-style-type: none"> <li>1. Shredder (For shredding Coconut Leaves) – 1 No</li> <li>2. HDPE Compost Bed(During final stage of composting 8ft x 4ft x 2ft) – 2 No</li> </ol>
5	Area required in Sqm	40 – 50
6	Approximate cost	<ol style="list-style-type: none"> <li>1. Shredder - 95,000/-</li> <li>2. HDPE Compost Bed – 2000 per piece</li> </ol>
7	Manpower required	2

	for maintenance	
8	Annual O&M cost	Salary for 2 No Manpower
9	Attach Photograph	Attached Below
10	Remarks if any	No
11	Contact	Assistant Executive Engineer Jagadeesh SR 9632983527







## Decentralized Community Waste Management Model at Madhugiri TMC

S.I no	Details of decentralised wet waste management at Madhugiri TMC	
1	Quantity of waste (TPD)	4 TPD
2	Type of waste processed	Household wet waste, dried leaves, Market waste
3	Technology adopted	Decentralized Bamboo composting at Bastigudi Madhugiri  45 days
4	Infrastructure required (Name of the components)	1) Fencing or compound wall with gate  2) Bamboo walls- 20ft * 8 ft
	Civil works	Compound wall with gate
	Methodology	The bamboo structure is fixed based on the space available in the site. Household wet waste is fed and a layer of dried leaves is spread on the waste along with cow dung spray. The waste gradually stabilizes. After 45 days the stabilised waste is removed and used as a feed to Vermi pits or can be sieved and used as compost.
5	Area required in Sqm	15 sqm
6	Approximate cost	Rs 20000 for Bamboo structure
7	Manpower required for maintenance	One Pourakarmika
8	Annual O&M cost	Manpower cost is Rs.2.5 lakhs Cowdung Rs 0.1 lakhs Total-2.15 lakhs
9	Attach Photograph	
10	Remarks if any	Remaining 1 ton of wet waste is managed through vermi compost in Landfill site

		
11	Contact :	Firoz Environmental Engineer 9980877770

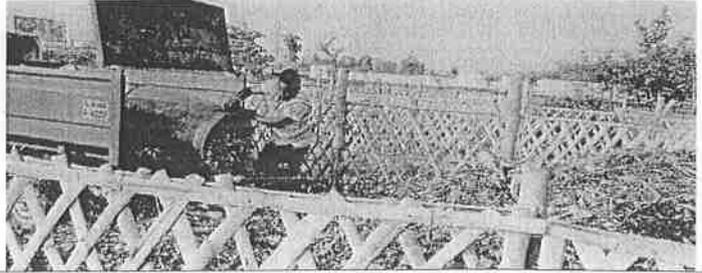
## Decentralised Community Waste Management Model at Kumta TMC

S.I no	Details of decentralised wet waste management at KUMTA TMC	
1	Quantity of waste (TPD)	6 TPD
2	Type of waste processed	Household wet waste, dried leaves
3	Technology adopted	Decentralized compost plant situated in TMC park in which 1 TPD of wet waste processed through pit composting, duration 90 days and 5TPD of wet waste is processed in home composting through pipe composting and pit composting, duration 45 days
4	Infrastructure required (Name of the components)	<ol style="list-style-type: none"> <li>1) separated space in tmc park, compound wall with gate</li> <li>2) 6 no. s of concrete pits inside open shed- 20 ft * 6 ft</li> <li>3) In home composting most of the people use different sized earthen pits based on space available, around 400 families uses pipe composting as method of processing.</li> </ol>
	Civil works	Construction of, shed, pits, Compound wall with gate
	Methodology	<ol style="list-style-type: none"> <li>1) Separated space in tmc park, compound wall with gate</li> <li>2) 6 no.s of concrete pits inside open shed- 20 ft * 6 ft</li> </ol> <p>6 no. s of concrete pits constructed inside open shed, pit size is 20 ft * 6 ft. Household wet waste is fed and a layer of dried leaves is spread on the waste along with cow dung spray. The waste gradually stabilizes. Every 3 days once waste is being turned and After 90 days the stabilised waste is removed and used as as compost. This compost is being sold to public nd also utilized for TMC parks.</p> <p>Earthen pits are excavated based on the space</p>

		available in the house premises. Household wet waste is fed and a layer of dried leaves is spread on the waste along with cow dung spray. The waste gradually stabilizes. After 45 days the stabilised waste is removed and used as compost for garden.
5	Area required in Sqm	The decentralized plant is situated in 5000 sq. ft area.
6	Approximate cost	Rs 500000 for the construction of shed and pits etc.
7	Manpower required for maintenance	2 Pourakarmikas
8	Annual O&M cost	Manpower cost is Rs. 4 lakhs/person Front Loader back hoe fuel – 0.8 lakhs/year Total-5lakhs
9	Attach Photograph	 
10	Remarks if any	Out of 6 TPD of wet waste generated, 5 TPD of wet waste is being processed at source as home composting. Only 1 TPD of waste is being processed in TMC decentralized waste processing plant.
11	Contact	Nagendra V Gaonkar Environmental Engineer 7760441199

## Decentralised Community Waste Management at Chikkaballapur CMC

S.I no	Details of decentralised wet waste management at Chikkaballapur CMC	
1	Quantity of waste (TPD)	4-5 TPD
2	Type of waste processed	Household wet waste, dried leaves
3	Technology adopted	Decentralized Bamboo composting 45 days
4	Infrastructure required (Name of the components)	1) Fencing or compound wall with gate 2) Bamboo walls- 20ft * 8 ft
	Civil works	Compound wall with gate
	Methodology	The bamboo structure is fixed based on the space available in the site. Household wet waste is fed and a layer of dried leaves is spread on the waste along with cow dung spray. The waste gradually stabilizes. After 45 days the stabilised waste is removed and used as a feed to Vermi pits or can be sieved and used as compost.
5	Area required in Sqm	15 sqm
6	Approximate cost	Rs 25000 for Bamboo structure
7	Manpower required for maintenance	One Pourakarmika
8	Annual O&M cost	Manpower cost is Rs1.9 lakhs Cowdung Rs 0.11lakhs

		Total-2lakhs
9	Attach Photograph	
10	Remarks if any	
11	Contact	Lohit .M Commissioner 9535885336

### Decentralised Community Waste Management at Ullal CMC

S.I no	Details of decentralised wet waste management at Ullal CMC	
1	Quantity of waste (TPD)	i) 0.86 TPD ii) 1TPD
2	Type of waste processed	Household wet waste
3	Technology adopted	i) Bin composting ii) Windrow composting
4	Infrastructure required (Name of the components)	i) Concrete bins & roof ii) Concrete bed & sheet
	Civil works	Concrete bed & sheet
	Methodology	i) In Concrete bins layer of dry leafs spread at the bottom, there after around 100kg of wet waste is filled. For fist week bio degrader & coco peat is added every day. In second week bio degrader & coco peat is added every alternative day. In third week the wet waste is kept idle in bin undergo decomposition. In fourth week the composted waste is dried & packed ii) In windrow composting a layer of old compost is spread upon which wet waste & small layer of coco peat is spread for the first day. In second day a layer of wet waste & coco peat layer is spread. Later on the procedure is continued in the same manner until the heap hip raises to about 3ft. Once in a week the heap turned.
5	Area required in Sqm	i) 2178sqft ii) 2178sqft
6	Approximate cost	i) Rs. 31200 for Bin composting ii) Rs. 2Lakhs
7	Manpower required for maintenance	two Poura karmikas
8	Annual O&M cost	Manpower cost is Rs.3.36 lakhs Cowdung Rs.2.4 lakhs Total- Rs.5.76 lakhs

9	Attach Photograph	
	Bin Composting Nearby Ullal CMC office	
	Windrow composting Kallapu ward	
10	Ready Compost from Ullal CMC	
11	Contact	Rayappa Comissioner 9449805561

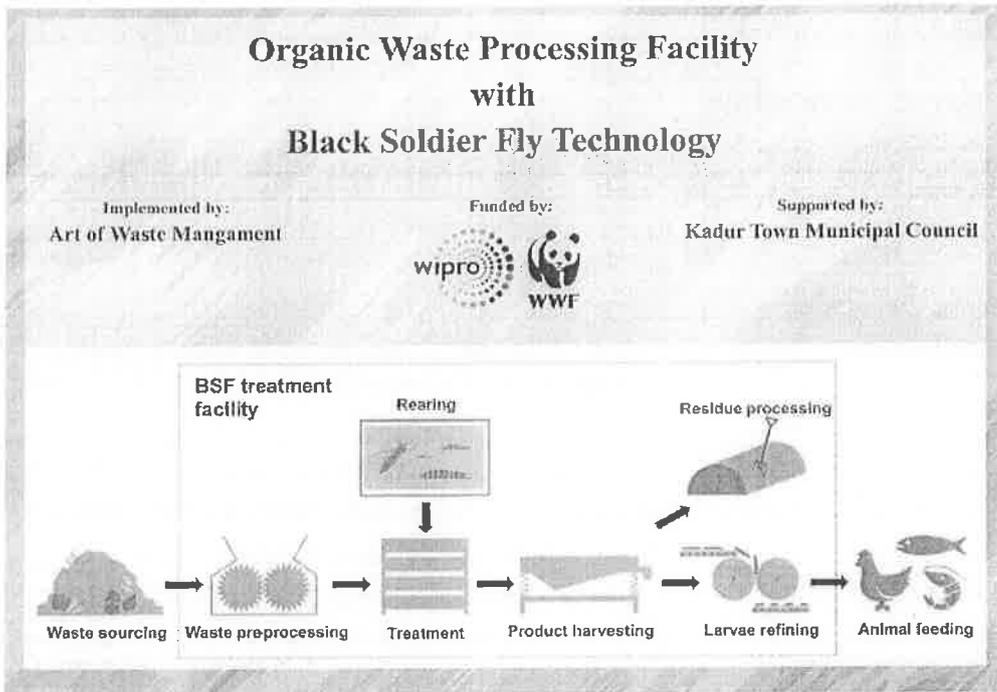
## Decentralised Community Waste Management at Kadur TMC

Sl.no	Details of decentralised wet waste management at Kadur TMC	
1	Quantity of waste (TPD)	1 TPD
2	Type of waste processed	Organic Municipal Wet Waste generated in Kadur Town
3	Technology adopted	Composting using Black Soldier Fly Larvae (BSFL)
4	Infrastructure required (Name of the components)	
	Civil works	Roof structure with flat flooring and walls with well ventilation
	Machineries	Waste Shredder, Dewatering unit, Feeding containers (Plastic Crates), Metallic Racks, and Sieving unit.
5	Area required in Sqm	Depends on the quantity of waste treated. We have facility of 65 Sq.m area and can be utilised to treat about 1 TPD of organic waste within a day.
6	Approximate cost	Rs. 15 Lakhs including civil infrastructure, Hatchery unit, Machinery and Equipment. (Capital cost)
7	Manpower required for maintenance	2
8	Annual O&M cost	Rs. 5 Lakh (Including Larval supply and Caretaker salary)
9	Attach Photograph	Attached below
10	Remarks if any	For the first time in India Kadur TMC has started organic waste composting using Black Soldier Fly Larvae ( <i>Hermetia illucens</i> ) in town scale and awarded Best city in 'Swachh Survekshan 2020' for 'Innovation & Best practices'.

11	Contact	Shreyas Environmental Engineer 9591911493
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**Photographs related to BSFL Treatment facility at Kadur TMC**

**ORGANIC WASTE COMPOSTING USING BLACK SOLDIER FLY LARVAE TECHNOLOGY**





*1. Waste collection by TMC from individual Households*



*2. Unloading of collected segregated organic wet waste at the facility*



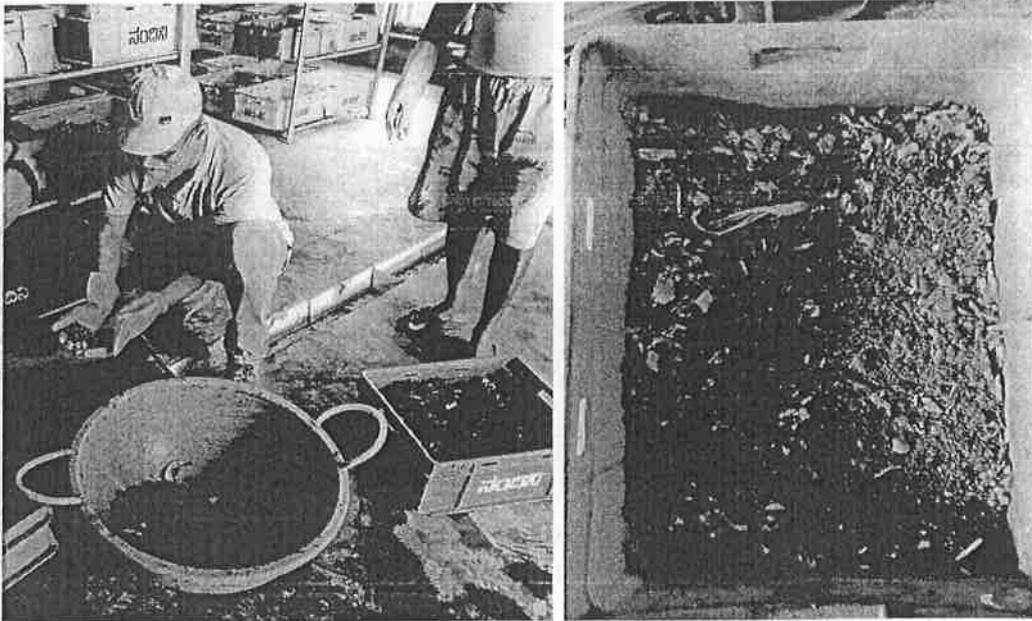
*3. Overview of the BSFL Composting Facility in Kadur*



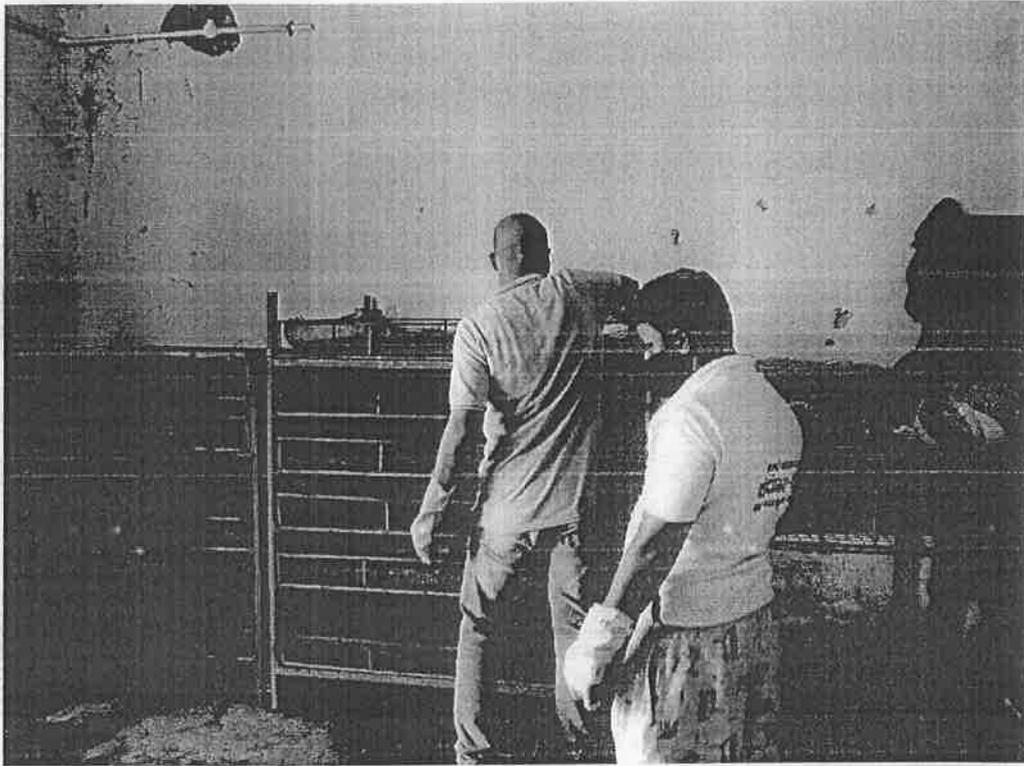
*4. Shredding of organic wet waste for homogenization*



5. Feeding of biowaste to Black Soldier Fly Larvae inside the container (discarded milk tray)



6. BSFL inside the container and the waste converted into compost



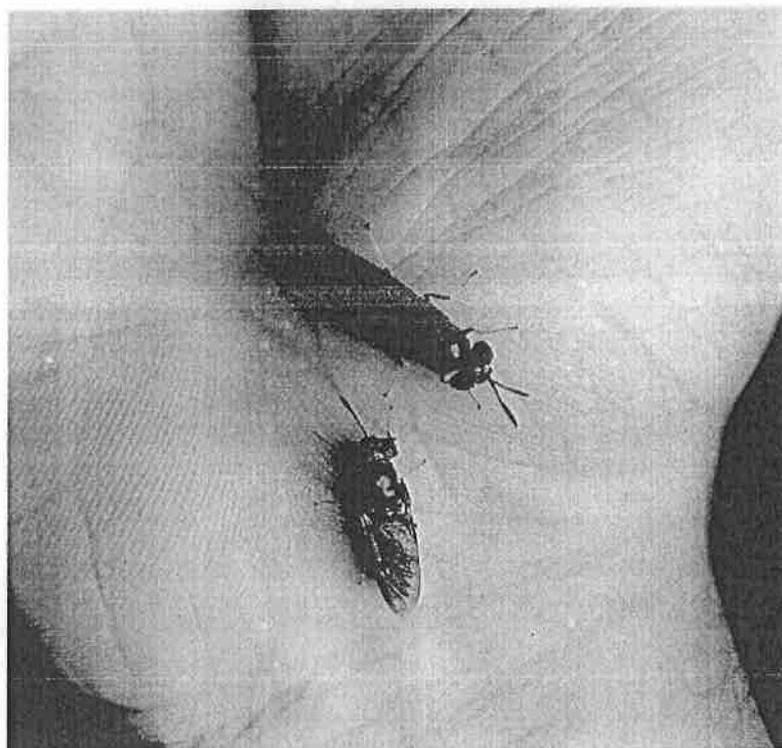
*7. After Conversion of waste into compost and matured larva then it is spread over the wired mesh for Sieving to separate residues and compost*



*8. Harvesting of matured Black Soldier Fly Larvae*



9. *Waste Management Professionals from Bengaluru visited the facility on 05-03-2020*



10. *Black Soldier Fly (Hermitia illucens. L) Male and Female*



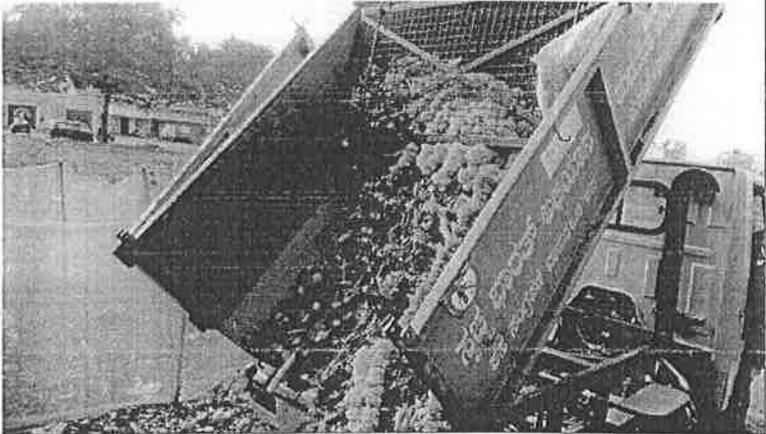
### Decentralised Community Waste Management at Mangalore CC

S.I no	Details of Conventional Biogas Plant established at Mangalore CC	
1	Quantity of waste (TPD)	2 tpd (presently receiving around 1-1.5tpd)
2	Type of waste processed	food waste –from hotels ,marriage halls,akshaya patra, supermarkets
3	Technology adopted	anaerobic digestion
4	Infrastructure required (Name of the components)	crusher, pre treatment , inlet chamber, main disgetor, sludge drying bed
	Civil works	crusher, pre treatment , inlet chamber, main disgetor, sludge drying bed
	Machineries	organic crusher, aircompressor, sludge pump, water collecting pump
5	Area required in Sqm	(60*40) sqft
6	Approximate cost	40 lakhs
7	Manpower required for maintenance	4 manpowers
8	Annual O&M cost	12,84,000.00
9	Attach Photograph	
10	Contact	Deepthi Environmental Engineer 9449841153



## Decentralised Community Waste Management at Krishnarajapete TMC

S.I no	Details of decentralised wet waste management at Krishnarajapete TMC	
1	Quantity of waste (TPD)	1.5-2.00 TPD
2	Type of waste processed	Household wet waste, dried leaves
3	Technology adopted	Decentralized Vermi composting  60 days
4	Infrastructure required (Name of the components)	1) Vermi Bags (10 Nos) 2) temporary bamboo shelter by using tarpaulin sheets
	Methodology	<p>Krishnarajapete TMC doesn't have fully developed Waste processing site due to some clearance issues. Therefore ULB has come up with alternative ideas to process the possible wet waste to process decentralised way within the Town.</p> <p>10 vermi bags made of polythene material are purchased under municipal fund. temporary shelter facility is created using locally available bamboo poles and tarpaulin sheets.</p> <p>Number of vermi bags is fixed based on the space available in the site. Household wet waste collected from Door-to-door collection through source segregation is openly dumped and left for stabilisation in open field for one week by spraying cow dung. After one week the waste is fed into the vermi bag for further de-composition of wet waste. Daily wet-waste is sprayed with cow-dung and humidity level is maintained. after 60 days the waste gets converted into compost</p>

		gradually. There is reduction in volume by 60 to 80 percent from the initial input till the compost is produced.
5	Area required in Sqm	450 Sqm
6	Approximate cost	Rs 50,000 for 10 Nos Vermi bags and Rs.5000 for temporary shelter. (One time capital investment. The bags can be shifted to any convenient place needed)
7	Manpower required for maintenance	One Pourakarmika
8	Annual O&M cost	Manpower cost is Rs1.9 lakhs Cowdung Rs 0.1lakhs Total-2lakhs
9	Attach Photograph  Wet waste collected through source segregation	
	Wet waste left for stabilisation for 07 days	

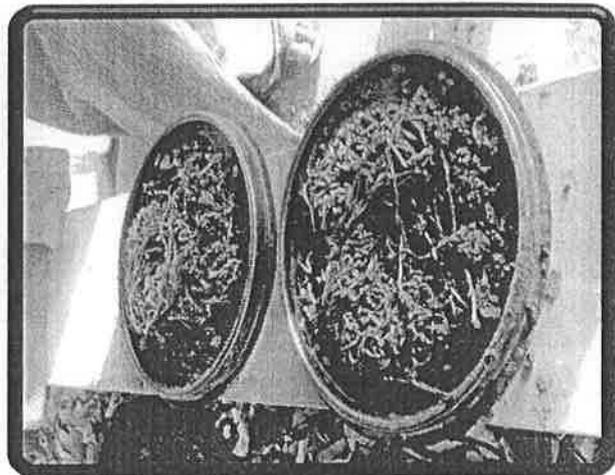
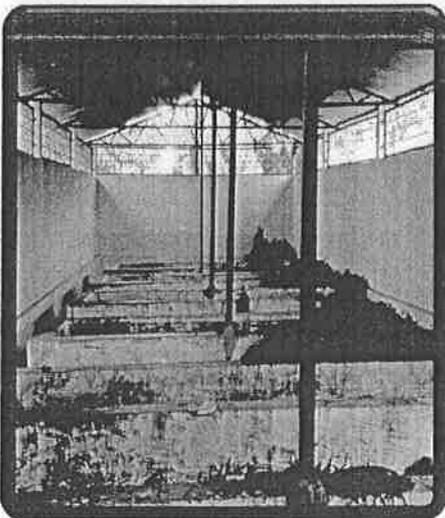
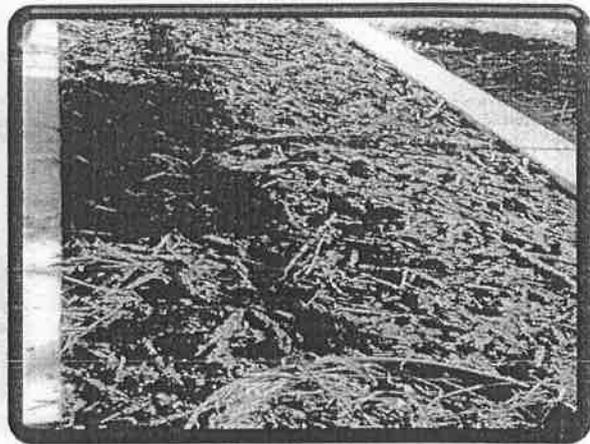
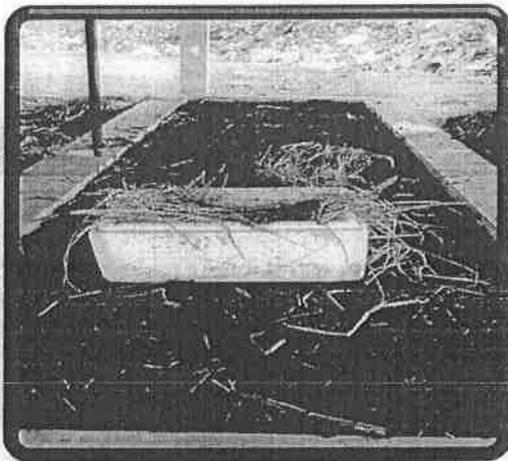
	Feeding waste to vermi bags	
10	Contact	<p>Archana Aradhya M  Environmental Engineer  8971180856</p>



## Decentralised Community Waste Management at Hoovinahadagali TMC

S.I no	Details of decentralised wet waste management at Hoovinahadagali TMC	
1	Quantity of waste (TPD)	1 TPD
2	Type of waste processed	Wet waste ( vegetables, fruits, garden waste , grass, market waste, animal food waste, tobacco leaves, food waste,and other decomposable organic waste )
3	Technology adopted	<p style="text-align: center;"><u>VERMI COMPOSTING</u></p> <p>Vermi composting is a method of preparing enriched compost with the use of earthworms.</p> <ul style="list-style-type: none"> <li>• Vermicomposting unit should be in a cool, moist and shade condition.</li> <li>• Wet waste is collected separately from households and is spread on the platform for 30 days which should be kept moist condition by sprinkling of water daily.</li> <li>• After 30 days partially decomposed material is fed to vermi pits.</li> <li>• Cow dung water is prayed on upper layer of the bed</li> <li>• Earth worms are released on the upper layer of bed.</li> <li>• Water is sprinkled immediately after the release of worms.</li> <li>• Compost gets ready in 45 to 50 days.</li> </ul>
4	Infrastructure required (Name of the components)	
	Civil works	1. Shed size - 27 ft width X83 ft length (1 no) 2. Pit size - 18ft length, 6 ft width, 1.5 ft Height (06 numbers) 3. Water supply - 1 inch Pipe line
	Machineries	-
5	Area required in Sqm	208 SQM
6	Approximate cost	5.00 Lakhs
7	Manpower required for maintenance	01 PK
8	Annual O&M cost	01 pk salary (3.00 Lakhs)
9	Attach Photograph	
10	Remarks if any	Raw material storage capacity of 06 pits is 5 tonnes,

		<p>after 45 to 50 days we get 1.5 to 2.0 tonnes compost.</p> <p>Total 21.75 tons of compost is been produced</p> <p>Total 15.50 tones Compost is been sold to Formers</p> <p>Cost per bag 300 Rs Net weight-35 to 40kgs</p> <p>total income generation rs 1,14,000.00</p>
11	Contact	<p>Jaffer</p> <p>Environmental Engineer</p> <p>9620804061</p>



## Decentralised Community Waste Management at Ramanagara CMC

S.I no	Details of decentralised wet waste management at Ramanagara CMC	
1	Quantity of waste (TPD)	1 TPD
2	Type of waste processed	Hotels' wet waste
3	Technology adopted	10 kv electricity generation biomethanation plant
4	Infrastructure required (Name of the components)	Fencing with gate
	Civil works	Digester, Inlet chamber, out let chamber, Generator room
	Methodology	Biogas plant rely on anaerobic digestion, a fermentation processed in which waste is digested by microbes to produce methane gas. the waste can be converted into biofertilizer. Biogas generated is fed to the generator of 10 KVA. Finally generated electricity is utilized for LED bulbs which are installed at biogas road and near by park.
5	Area required in Sqm	35 sqm
6	Approximate cost	Rs 26.00 lakhs
7	Manpower required for maintenance	2 Pourakarmikas
8	Annual O&M cost	Manpower cost is Rs 3.6 lakhs Hotel waste carry vehicle cost is Rs 0.36 lakhs Total- Rs 3.96 lakhs
9	Attach Photograph	

		
10	Remarks if any	Installed year 2016
11	Contact	Subramanya M K Assistant Executive Engineer 9986872078