

**Proceedings of the Executive Director, Suchitwa Mission,
Thiruvananthapuram
(Present: Sri. Mir Mohammed Ali IAS)**

Sub:- LSGD- Suchitwa Mission- approval of unit cost for household level/ small unit solid waste management devices adopted for processing of solid waste-reg.

- Read:-
1. Proceedings No. 2503/C2/2018/SM dated 13-04-2021 of the Executive Director, Suchitwa Mission.
 2. Proceedings No. 2869/C2/2016/SM dated 09-08-2021 of the Executive Director, Suchitwa Mission.
 3. Minutes of the Technical Committee Meeting held on 18-08-2021 at Suchitwa Mission.

Order No. 2869/C2/2016/SM

Date : 15/09/2021

As per order, read 1st above the technical committee for approving the Solid Waste Management Devices/Technologies had approved a few Waste Management Devices. The unit rate for those devices was not fixed at that time. As per the order read 2nd above, a Rate Fixation Committee was constituted for scrutinizing and approving the rates of newly approved Solid Waste Management Devices. Executive Director, Suchitwa Mission convened the Rate Fixation Committee meeting on 18.08.2021 and the rate submitted by the agencies were verified and scrutinized by the said committee.

As per the paper read 3rd above the Rate Fixation Committee approved the unit rates of the newly approved waste management devices viz; Geebin, V-Composter, Smart Biobin and Mosquito Free Portable Biogas Plant (size – 0.75m³ & 1.5m³) as follows:-

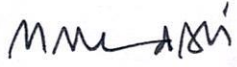
Sl.No.	Name of Device	Proposed By	Approved Unit Cost (in Rs.)
1	GEEBIN (3 Bin System) 2kg/day	Foabs Solution Pvt. Ltd. Startups Valley Tbi, Amal Jyothi College Of Engineering, Koovapally, Kanjirapally, Kottayam Phone: 91 4812953999, 919497333999 foabsolutions@gmail.com	4,300/-

2	V-Composter 1.5kg/day	V – Care Shopping, Kripa, Valiya Vilapuram, Ottasekharamangalam Trivandrum – 695125 Ph: 9916354389, 9544098935 subeesh@gmail.com	5,150/-
3	Smart Biobin 2 kg/day	Chief Coordinator, Laloor Model Project for Solid Waste Management (LAMPS), Instructional Farms, P.O. KAU, Vellanikkara. 9497365443 lampsatkau@gmail.com	2,450/-
4	Mosquito Free Portable Biogas Plant Size - 0.75 Cum.	Biotech, Post Box No.520, MP Appan Road, Vazhuthacad, Thycaud P.O, Thiruvananthapuram 0471-2321909, 2332179. 9447792179, 9446000965 mailtobiotech@gmail.com	24,600/-
5	Mosquito Free Portable Biogas Plant Size - 1.5 Cum.	Biotech, Post Box No.520, MP Appan Road, Vazhuthacad, Thycaud P.O, Thiruvananthapuram 0471-2321909, 2332179. 9447792179, 9446000965 mailtobiotech@gmail.com	31,400/-

The unit cost approved against each technology is including cost of materials, tools and equipments as per standard specification, labour, conveyance including installation at the household/user location and commissioning the facility. Cost is also inclusive of all taxes payable. All incidental expenditure including cow dung and other expendable items required for completing the unit has to be provided and it is inclusive of the unit cost. The agency undertaking the supply shall also train the beneficiary in operation and capacity building of the unit. The agency should also provide one year free warranty period from the date of installation of the unit during which they shall repair/replace all defective items at free of cost. The entire facility shall be designed/ fabricate/ supplied/ installed using appropriate technology for the safe use by the beneficiary.

As per the recommendations of the committee vide paper read 3rd above, the unit cost for above mentioned waste management devices are hereby approved.

Encl: Specifications


Executive Director

- Copy to:-
1. Director of Urban Affairs
 2. Director of Panchayats
 3. All District Co-ordinators, Suchitwa Mission
 4. Secretaries of all Grama Panchayats & ULBs through District Co-ordinator, Suchitwa Mission.
 5. OC/SF/ Website

Annexure

I. Gee Bin – composting unit(2 Kg/day capacity)

No	Detailed Specification	Unit Cost (in Rs.)
Gee Bin with the following specification and size		
	<ul style="list-style-type: none"> – Poly Propylene Co-Polymer (PPCP) made 29 liter capacity bins (3 Nos), each with a base ring, upper plate and filter plate and leachate tray is used for treating 2kg waste per day. – One lid for covering the top most bins is provided. – Each bin has two parts. Inner digester and outer covering bin as protective system which helps to prevent entering of flies and insects into the digester. – Filter plates are fixed at the bottom of digester for easy drain of leachate. Leachate trays are placed above the base ring. – Base rings are provided for holding the upper bin duly meant for fixing the leachate tray and one upper ring for fixing the lid. 	4,300/-
Infrastructure Requirement		
	<ul style="list-style-type: none"> – Inner digester bin dimensions are, 331 mm dia, 335 mm height, 2.4 mm gauge. It is 29 liter capacity and having 2 mm dia holes all around for ventilation. – Outer bin dimensions are 383 mm dia, 335 mm height, 2.4 mm gauge, 1.5 mm dia holes provided all around for ventilation. – Upper plate is having 384mm dia, 51 mm height and 2.75 mm thickness for fixing the lid. – The base rings are having 2.75 mm gauge, 384 mm dia and center hole of 204 mm dia duly meant for fixing leachate tray and for holding the upper bin. – The leachate trays are having 204 mm dia, 23 mm height 	

	<p>1.35mm thickness fixed in the base ring.</p> <ul style="list-style-type: none"> - The bins contains a lid 418 mm dia, 112 mm height, 2.6mm thickness and 2 mm dia holes are provided at 65 mm width all round for ventilation of hot air. - Each inner & outer bins are vertically dived into halves. Inner bin is assembled with 6 nut & bolts, and outer bin is assembled with 10 nut & bolts. - Filter plates 320 mm Dia, 2.4 mm thickness and the central portion 15mm dia with 3mm dia holes for easy drain of leachate. - Microbes enriched inoculum for water absorption and aeration. (Starter) - Tool (hand fork) for stirring the waste. 	
O & M Protocol		
	<ul style="list-style-type: none"> - The inner digester bin is assembled with nut & bolts. - Fix the filter plate at the bottom of the inner bin by pressing it at the bottom of the inner bin. - Place the base ring and fix the inner bin into it. - Assemble the outer cover with nut & bolts and place it in the base ring. - Place the bins over the base rings and arrange them as one over another. - Fix the leachate tray at the base ring. It is optional to put some dry coco-peat into the leachate tray for absorbing the excess leachate. - Spread a little soaked inoculum at the bottom of upper digester bin as a thin layer. Then start loading the bio waste into the upper bin. Again put the inoculum over the bio waste, after every use, cover the upper bin with lid. Occasionally mix the fresh waste with the old waste. - One bin will be filled with in 25 to 30 day time in a family of 5 members. - Replace the filled bin with the empty one and place the lid on 	

	<p>it. Repeat the same procedure for each 3 bins.</p> <ul style="list-style-type: none"> - By the time of filling the other two bins the first one will be fully composted/ matured. Empty the first one and start composting again. - Dry the removed compost under shade, then it can be used as a starter for the next cycle of composting - Periodically clean the leachate tray. The collected leachate may be used as inoculum for composting or can be used as manure in the garden. 	
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II. V composter – composting unit (1.5 Kg/day capacity)

No	Detailed Specification	Unit Cost (in Rs.)
V composter with the following specification and size		
	<ul style="list-style-type: none"> - Two numbers of ventilated HDPE bins of 60 liter capacity with HDPE lid for covering the composter bins are provided for treating 1.5 kg/day waste. - Holes all around its circumference and its bottom is provided for ensuring proper air circulation inside the bins. - To strain liquid particles from waste so as to avoid presence of excess moisture content inside the composter bins, a PVC filter plate is provided. - HDPE trays for leachate collection placed outside the box to collect the leachate generated from the composter. - Microbes enriched inoculum developed by Kerala Agriculture University and 1 sack of coir pith for water absorption and better waste digestion is provided. - The whole system is enclosed in a box made of GI frame of size 77.5x52x76 cm, covered with 0.35 mm thick GI metal sheet with covering lid of size 82x56 cm, covered with 0.6 mm thick GI metal sheet for protecting the composter from the nuisance of rats and to provide a good appearance. 	5,150/-

	Infrastructure Requirement	
	<ul style="list-style-type: none"> - Two nos. of HDPE bins of 60 liter capacity with HDPE lid. - The bins contain 2 mm dia holes all round its circumference and its bottom. - A Filter made of PVC to strain liquid particles from waste. - Two nos. of HDPE trays for leachate collection. - 1 Kg of Microbes enriched inoculum developed by Kerala Agriculture University and 1 sack of coir pith. - A box made of GI frame of size 77.5x52x76cm, covered with 0.35 mm thick GI metal sheet with covering lid of size 82x56 cm, covered with 0.6 mm thick GI metal sheet 	
	O & M Protocol	
	<ul style="list-style-type: none"> - Spread a little microbes enriched inoculum in the bins as a thin layer and close the bins with the covering lid. - Place the two bins inside the GI box and close the box lid. - Strain the bio waste with filter to avoid presence of excess moisture content inside the composter bins. - Spread the bio waste inside the bin and again put a little inoculum over the biodegradable waste, cover the bin with lid. - Leachate collection tray is placed outside the box; it is optional to put a little salt in the tray for avoiding mosquito breeding. - Occasionally mix the fresh waste with the old waste. After this keep the bin closed with the covering lid. - One bucket will become filled within 45 days' time in a family of 5 members. Left it for composting and the second bin is taken into use for another 45 days. - Repeat the same procedure for both the bins. - By the time of filling the second bin the first one will be fully composted. Then empty the first one and start composting again. 	

	<ul style="list-style-type: none"> - Dry the removed compost under the shade. It can be used as manure in garden. - The fully composted waste can be used as a starter for the next cycle of composting. - Periodically drain the leachate from leachate collection tray. The diluted leachate can also be used as manure in garden. 	
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III. Smart bio bin – composting unit (2 Kg/day capacity)

No	Detailed Specification	Unit Cost (in Rs.)
Smart bio bin with the following specification and size		
	<ul style="list-style-type: none"> - Hollow cylinder with outer ring made of Stainless steel coin mesh with supporting legs and a platform (for holding the bio mass inside the cylinder) and inner ring made of GI weld mesh is proposed for treating 2kg waste per day. - A plastic tray and spatula is provided for collecting the compost. - The hollow cylinder is covered with perforated ACP sheet as lid with locking arrangements 	2,450/-
Infrastructure Requirement		
	<ul style="list-style-type: none"> - Hollow cylinder with 50.80 cm (20 inches) dia outer ring made of Stainless steel coin mesh and 45.72 cm(18 inches) dia inner ring made of 1 1/4 X 1 1/4 inches 14 gauge GI weld mesh with a height of 114.30 cm (3 3/4 feet). - 3 no.s of 114.30 cm(3 3/4 feet) long supporting leg made of GI square pipe with plastic bush, welded inside the hollow cylinder. - A platform made of 1 1/4 X 1 1/4 inches 8 gauge GI weld mesh fixed 15.24 cm (1/2 feet) height from the bottom. - Plastic tray of size 48.26 cm (19 inches) dia paced in a stand below the cylinder. - GI made spatula. - Lid made of 51cm dia perforated ACP sheet with locking arrangements. 	

O & M Protocol	
	<ul style="list-style-type: none"> - Crushed dry leaves or paper is spread in the bottom of inner shell of smart Biobin, so that it will facilitate easy drain of compost into the bottom tray. - Coconut husk or dry leaves are filled in the outer shell of the smart bio bin, to absorb leachate or liquid particles from the waste. - The daily bio waste and dry leaves is spread over the crushed leaves in sandwich model - A single smart bio bin will filled up within 45 days' time. During this time the bottom most waste will become compost. - The spatula attached at the very bottom is turned for easy drain of compost. - Waste can be fed continuously into the bin, since compost is obtained from the bottom portion.

IV. Mosquito Free Biogas plant (0.75 m³ or 5 kg/day capacity)

No	Detailed Specification	Unit Cost (in Rs.)
Mosquito Free Biogas plant with the following specification and size		
	<ul style="list-style-type: none"> - 500 liter capacity, 4mm thick FRP made Digester. - 300 liter capacity Gas holder made of 2 mm thick Geo membrane sheets inserted inside, the 30 cm depth water column for water sealing. An over lapping wing of gas holder is fixed outside the digester for better air sealing. - 5 liter capacity PVC made inlet tank with lid. - 3 inch diameter, 6kg/cm², 70 cm height PVC inlet pipe fixed 30 above from bottom of digester. - 4 inch diameter, FRP molded 40 cm height S curved out let pipe fixed 40 cm below the digester top edge. - Supporting frame made of 2mm GI tube, complete with all nuts and bolts for supporting the gas holder balloon. 	24,600/-

	<ul style="list-style-type: none"> - 5Kg cement concrete block as counter weight to be placed over the gas holder to generate good gas pressure. - 5 liter capacity FRP made round shaped weight cap. - 5 M length gas connection rubber hose with inbuilt safety valve. - 1 No. of 12 cft Stainless steel single burner gas stove. 	
	Infrastructure Requirement	
	<ul style="list-style-type: none"> - Treatment capacity - 5 kg of solid waste per day. - Digester 500 liter capacity, 4 mm thick FRP made. - Gas holder - 300 liter capacity, made of 2 mm thick Geo membrane sheets inserted inside, the 30 cm depth water column. An over lapping wing of gas holder is fixed outside the digester. - Inlet tank with lid - 5 liter capacity PVC made. - Inlet pipe - 3 inch diameter, 6kg/cm², 70 cm height PVC pipe, fixed 30 above from bottom of digester. - Out let pipe - 4 inch diameter, FRP molded 40 cm height, S curved structure, fixed 40 cm below the digester top edge. - Supporting frame - made of 2mm GI tube, complete with all nuts and bolts. - Initial charging - 50 kg of cow dung - Counter weight - 5Kg cement concrete block as. - Weight cap - 5 liter capacity FRP made round shaped. - Gas tube - 5 M length gas connection rubber hose with inbuilt safety valve. - Gas stove - 1 No. of 12 cft Stainless steel single burner gas stove. 	
	O & M Protocol	
	<ul style="list-style-type: none"> - Adding 50 kg of cow dung with equal quantity of water charged in the digester for fermentation for 2 weeks' time. - Mix chopped solid waste with water in ratio of 1:1 	

	<ul style="list-style-type: none"> - Limit the maximum quantity of daily feeding of waste to 5 kg/day. - The gas connector is fixed to the stove. - Hot water or curd is introduced as digestion accelerator. - Empty the over flow slurry/ effluent using a can/ plastic bucket by opening the out let pipe cap. (If toilet waste is also treated in biogas plant, slurry from biogas plant to be treated in a septic tank soak pit arrangement.) - Clean the inlet chamber after each feed and keep it closed. - Do not feed waste of slow degrading nature like egg shells, fibrous materials like banana leaves, coconut shells, coir pith, pseudo stem etc. and toxic substances like fungicides, insecticides, pesticides, detergents and disinfectants like phenyl, antiseptic liquids, floor cleaning lotions etc. 	
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V. Mosquito Free Biogas plant (1.50 m³ or 10 kg/day capacity)

No	Detailed Specification	Unit Cost (in Rs.)
Mosquito Free Biogas plant - with the following specification and size.		
	<ul style="list-style-type: none"> - 1000 liter capacity, 4mm thick FRP made Digester. - 700 liter capacity Gas holder made of 2 mm thick Geo membrane sheets inserted inside, the 30 cm depth water column for water sealing. An over lapping wing of gas holder is fixed outside the digester for better air sealing. - 5 liter capacity PVC made inlet tank with lid. - 3 inch diameter, 6kg/cm², 70 cm height PVC inlet pipe fixed 30 above from bottom of digester. - 4 inch diameter, FRP molded 40 cm height S curved out let pipe fixed 40 cm below the digester top edge. - Supporting frame made of 2mm GI tube, complete with all nuts and bolts for supporting the gas holder balloon. - 5Kg cement concrete block as counter weight to be placed over the gas holder to generate good gas pressure. 	31,400/-

	<ul style="list-style-type: none"> - 5 liter capacity FRP made round shaped weight cap. - 5 M length gas connection rubber hose with inbuilt safety valve - 1 No. of 12 cft Stainless steel single burner gas stove. 	
	Infrastructure Requirement	
	<ul style="list-style-type: none"> - Treatment capacity - 10 kg of solid waste per day. - Digester - 1000 liter capacity, 4mm thick FRP made - Gas holder - 700 liter capacity, made of 2 mm thick Geo membrane sheets inserted inside, the 30 cm depth water column for water sealing. An over lapping wing of gas holder is fixed outside the digester for better air sealing. - Inlet tank with lid - 5 liter capacity PVC made. - Inlet pipe - 3 inch diameter, 6kg/cm², 70 cm height PVC pipe, fixed 30 above from bottom of digester. - Out let pipe - 4 inch diameter, FRP molded 40 cm height; S curved structure fixed 40 cm below the digester's top edge. - Supporting frame - 2 mm GI tube, complete with all nuts and bolts for supporting the gas holder balloon. - Initial charging - 100 kg of cow dung - Counter weight - 5Kg cement concrete block. - Weight cap - 5 liter capacity, FRP made round shaped. - Gas tube - 5 M length rubber hose with inbuilt safety valve. - Gas stove - 1 No. of 12 cft Stainless steel with single burner gas stove. 	
	O & M Protocol	
	<ul style="list-style-type: none"> - Adding 100 kg of cow dung with equal quantity of water charged in the digester for fermentation for 2 weeks' time. - Mix chopped solid waste with water in ratio of 1:1 - Limit the maximum quantity of daily feeding of waste to 10 litter/day. - The gas connector is fixed to the stove. - Hot water or curd is introduced as digestion accelerator. 	

	<ul style="list-style-type: none">- Empty the over flow slurry/ effluent using a can/ plastic bucket by opening the out let pipe cap. (If toilet waste is also treated in biogas plant, slurry from biogas plant to be treated in a septic tank soak pit arrangement.)- Clean the inlet chamber after each feed and keep it closed.- Do not feed waste of slow degrading nature like egg shells, fibrous materials like banana leaves, coconut shells, coir pith, pseudo stem etc. and toxic substances like fungicides, insecticides, pesticides, detergents and disinfectants like phenyl, antiseptic liquids, floor cleaning lotions etc.	
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