

BEFORE THE NATIONAL GREEN TRIBUNAL**PRINCIPAL BENCH, NEW DELHI****O.A. No. 606 OF 2018****(In respect of Lakshadweep)****IN THE MATTER OF:**

RE: Compliance of Municipal Solid Waste Management Rules, 2016 and other environmental issues.

INDEX

SL NO.	PARTICULARS	PAGE NO.
1.	Affidavit on behalf of advisor to administrator of Lakshadweep administration in compliance of order dated 23.04.2024	1-45
2.	ANNEXURE A/1 A copy of the order dated 18.05.2024 constituting the High-Level Monitoring Committee on Liquid Waste Management and other environmental matters in UT of Lakshadweep	46

3.	<p>ANNEXURE A/2 (Colly).</p> <p>Copies of the Status report for September 2024 from the Technical Assistants/ Scientist posted in the islands</p>	47-51
4.	<p>ANNEXURE A/3</p> <p>A copy of the authorization dated 30.10.2023 issued by one of the Village Panchayats, viz, Kadmat for providing service of Packing and Transportation of segregated Recyclable materials from Central Garbage Depository, Kadmat and its shipment and delivery to Recycling Treatment Facility at mainland under Solid and Plastic Waste Management Rule, 2016</p>	52-53
5.	<p>ANNEXURE A/4</p> <p>A copy of the authorization dated 29.09.2023 issued by the Department of Panchayat to collect/purchase all recyclable waste under Solid and Plastic Waste Management Rule, 2016</p>	54-55

6.	ANNEXURE A/5 A copy of joint expert committee report dated 20.08.2024 on Liquid Waste Management in Lakshadweep Islands submitted by the Technical Members	56-67
----	--	-------

THROUGH



(Apoorv Kurup)

Advocate (D/554/2005)

A-2/141, Lower Ground Floor,

Safdarjung Enclave, New Delhi -110029

Mobile: +91 8800185864

Email: office@akurup.com

Dated: 07.11.2024

Place: New Delhi

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL,
PRINCIPAL BENCH AT NEW DELHI

ORIGINAL APPLICATION NO. 606 OF 2018

IN THE MATTER OF:

COMPLIANCE OF MUNICIPAL SOLID WASTE
MANAGEMENT RULES, 2016 AND OTHER
ENVIRONMENTAL ISSUES

AFFIDAVIT ON BEHALF OF ADVISOR TO ADMINISTRATOR
OF LAKSHADWEEP ADMINISTRATION IN COMPLIANCE
OF ORDER DATED 23.04.2024

MOST RESPECTFULLY SHOWETH:

I, Sandeep Kumar s/o S. Prasad, aged 52 years, presently posted as
Advisor to the Administrator, Union Territory of Lakshadweep
Administration, Kavaratti, Lakshadweep, do hereby solemnly affirm
and sincerely state as follows based on the official records that are
placed before me:

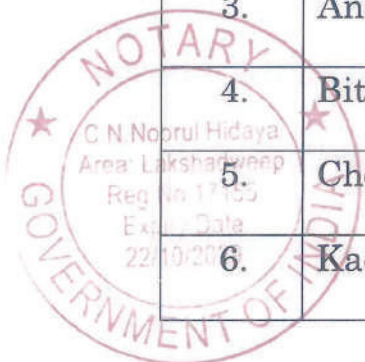
1. That, I am the officer-in-charge on behalf of the Answering
Respondent in the captioned matter. I am conversant with the
facts and circumstances of the instant case, based on the records/
information maintained and available with the Petitioner. As
such, I am competent and authorized to swear this affidavit in
my official capacity.

C.N. NOORUL HIDAYA
ADVOCATE & NOTARY
GOVT. OF INDIA, Area: Lakshadweep
Reg. No. 17155, Expiry Date: 22/10/2029

BRIEF INTRODUCTION

2. The Union Territory of Lakshadweep is India's smallest UT, an archipelago with an area of approximately 32 sq. km. It is a uni-district Union Territory and comprises of 12 atolls, 3 reefs, 6 submerged banks, 10 inhabited islands and 17 uninhabited islands. The headquarter of the UT is located at Kavaratti. All Islands are approximately 220 to 440 km away from the mainland.
3. The total population of Lakshadweep, as per the 2011 census, is 64,473. The total population growth in this decade was 6.30%, while in the previous decade, it was 17.19%.
4. The population as per the Census 2011 and the area of each of the inhabited islands of the UT is as follows:

S.No.	Island	Population	Area (in sq. Km.)
1.	Agatti	7566	3.83
2.	Amini	7661	2.59
3.	Androth	11191	4.84
4.	Bitra	271	0.10
5.	Chetlat	2347	1.04
6.	Kadmath	5404	3.12



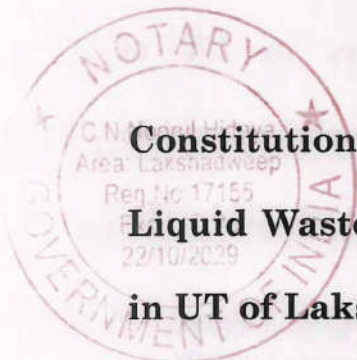
C.N. NOORUL HIDAYA
ADVOCATE & NOTARY
GOVT. OF INDIA, Area: Lakshadweep
.. 17155 Expiry Date: 22/10/2018

7.	Kavaratti	11221	4.22
8.	Kalpeni	4419	2.79
9.	Kilthan	3946	1.63
10.	Minicoy	10447	4.39
TOTAL		64,473	28.55

(Source: Census of India, 2011)

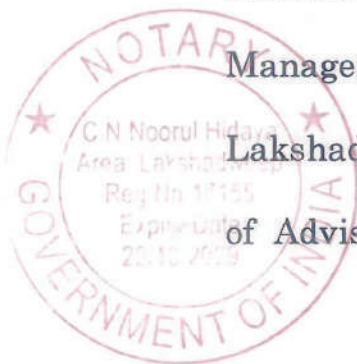
5. The present affidavit has been prepared in compliance with the order dated 14.05.2019 passed by this Hon'ble Tribunal wherein, in para 45(ii), it has been directed to furnish quarterly reports. The present report indicates the progress for the period from 01.04.2024 to 30.09.2024. Further, it is also submitted in compliance with the directions passed by this Hon'ble Tribunal vide order dated 23.04.2024.
6. That, subsequent to the observations/ directions passed by this Hon'ble Tribunal, the Lakshadweep Administration has undertaken the following steps:

**Constitution of High-Level Monitoring Committee (HLMC) on
Liquid Waste Management and other environmental matters
in UT of Lakshadweep**



C.N. NOORUL HIDAYA
ADVOCATE & NOTARY
GOVT. OF INDIA, Area: Lakshadweep
Reg. No:17155, Expiry Date:22/10/2029

7. It is humbly submitted that immediately after the aforesaid order dated 23.04.2024 passed by this Hon'ble Tribunal, a meeting was held under the chairmanship of Advisor to Administrator to discuss the status of waste management in Lakshadweep. That, during the meeting, it was *inter-alia* decided to constitute a Committee consisting of concerned Departmental Secretaries of UTLA, and that the Committee shall also include 2-3 external technical members. Accordingly, request letters were sent to the Director of the National Environmental Engineering Research Institute (NEERI) and National Centre for Sustainable Coastal Management (NCSCM) to nominate technical expert member to the Committee. That, a request was also made to Dr. Anas Abdul Azeez, Principal Scientist, CSIR- National Institute of Oceanography, Kochi, the then member of Lakshadweep Pollution Control Committee, to convey his willingness to be a technical member of the Committee. That, based on the replies received from NEERI and NCSCM, a "High-Level Monitoring Committee on Liquid Waste Management and other environmental matters in UT of Lakshadweep" (HLMC) was constituted under the chairmanship of Advisor to Administrator vide order dated 18.05.2024. The



Committee also included the following technical members such as:

- a) Dr. Girish R Pophali, Chief Scientist, CSIR-NEERI, Nagpur
- b) Dr. Robin R.S, Scientist, NCSCM, Chennai
- c) Dr. Anas Abdul Azeez, Principal Scientist, CSIR-National Institute of Oceanography, Kochi

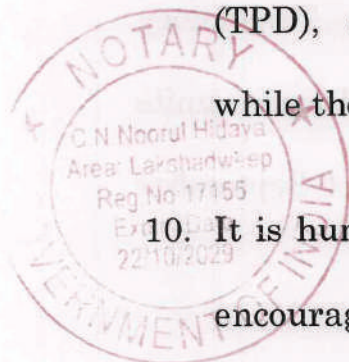
A copy of the order 18.05.2024 constituting the High-Level Monitoring Committee on Liquid Waste Management and other environmental matters in UT of Lakshadweep is annexed herewith and marked as **ANNEXURE A/1**.

8. The Committee held three meetings on 06.06.2024, 05.07.2024 and 23.08.2024 to discuss issues relating to Solid Waste Management and Liquid Waste Management in Lakshadweep.

Biodegradable Waste Management – Kitchen Waste

9. It is submitted that Solid waste generation in the UT of Lakshadweep islands was assessed as about 18 tonnes per day (TPD), out of which about 12 TPD is non-biodegradable waste while the balance 6 TPD is mainly kitchen waste.

10. It is humbly submitted that the residents/ people of the UT are encouraged to manage the Kitchen Waste at the household level,



C.N. NOORUL HIDAYAT
ADVOCATE & NOTARY
GOVT. OF INDIA, Area: Lakshadweep
Reg No: 17155, Expiry Date: 22/10/2024

such as by feeding it to animals like cattle, goats, poultry, etc. Further, the Department of Panchayat held meetings on 07.05.2024 and 30.05.2024 under the chairmanship of the Secretary (Panchayats), with key stakeholders from various departments such as Animal Husbandry, Agriculture, Fisheries, Science & Technology, and Industries to assess the consumption of kitchen waste by cattle, poultry, goats in the islands. It was observed that a total of 620 cattle, 22,680 goats, and 83,410 poultry are available as per the Department of Animal Husbandry statistics for the year 2023-24. The average requirement for consumption of cattle, poultry, and goats was estimated at 10.64 MT/day.

11. That, moreover, the Department of Science and Technology has also installed and commissioned 35 biogas plants across Kavaratti, Minicoy, and Kalpeni islands, with varying capacities of 1 m³, 2 m³, 0.75 m³, and 0.6 m³. These plants collectively can manage up to 269.5 kg of kitchen waste per day. It is to further inform that the Department of Science & Technology obtains periodic performance reports of the 35 Biogas units installed in the three islands. As per the report of September



2024, 28 units are working properly, and the concerned householders are satisfied.

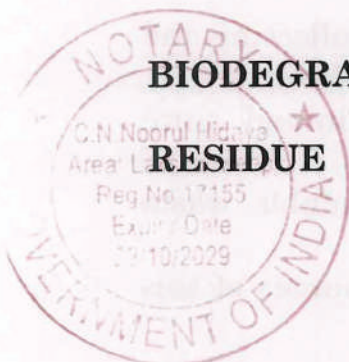
Copies of the Status report for September 2024 from the Technical Assistants/ Scientists posted in the islands are annexed herewith and marked as **ANNEXURE A/2 (Colly)**.

12. Thus, it is humbly submitted that the kitchen waste generated from households is consumed at the generation site itself, and no net biodegradable kitchen garbage pile is noticed anywhere on the islands.

13. That, furthermore, the UTLA has also decided to install Biogas plants in various Government Guest Houses and Schools in a phased manner. Accordingly, the Public Works Department and Education Department carried out an assessment of the kitchen waste. The Lakshadweep PWD has thereafter invited tenders for the installation of a Biogas unit in Agatti Guest House in the first instance. The kitchen waste, if any, from neighbouring households can also get consumed in these units.

BIODEGRADABLE WASTE MANAGEMENT - COCONUT

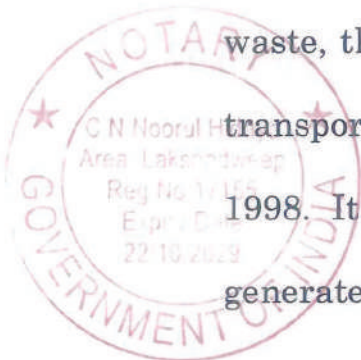
RESIDUE



14. As per a paper published by ICAR-CPCRI, Kasargod, Kerala and KVK, Lakshadweep, *“about 15 to 21 tonnes of biomass as leaves, bunch waste and husk are available in one hectare of coconut garden”*. As per the official statistics for the year 2018-19, the total area under coconut cultivation in Lakshadweep is 2674.87 hectares. Accordingly, the quantity of coconut biomass generation will be about 40,000 – 56,000 MT. About 2000 MT per annum of coconut husk is consumed in maasmeen (traditional smoked or dried fish) production, coir industry, agriculture purposes and as cooking fuel (in 2 islands). As there is a surplus of coconut husk, the Department of Panchayat has published an Expression of Interest (EOI) to invite Agencies/Organizations/NGOs for scientific management of coconut biomass generated in Lakshadweep by outsourcing the activities through Public Private Participation (PPP).

NON – BIODEGRADABLE WASTE MANAGEMENT

15. That, with respect to the management of Non-Biodegradable waste, the Lakshadweep Administration has been collecting and transporting non-biodegradable waste to the mainland since 1998. It is estimated that the total Non-biodegradable waste generated per day is about 12 MT. The primary sources of this

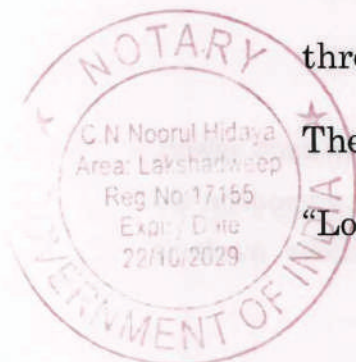


waste include households, shops, restaurants, institutions, markets, and waste from the seashore, which is brought by wind and waves. The Administration has adopted various strategies for the management of the 12 TPD solid waste generated in the islands, and the same is explained below:

a) **Supply of Household and Community Dustbins:** In the inhabited islands, the Village Panchayats in coordination with the Department of Panchayat distributed 11,574 dustbins to the households in January 2023. In addition, 4686 community bins of 150-litre capacity were also placed in the residential areas. The Department of Panchayat has now purchased an additional 13,066 dustbins for distribution to the households. Repair and repainting of 2569 old community dustbins are in progress, while the Department has also invited tenders for purchase of additional 1294 community dustbins now.

b) **Management of Waste:** The Administration took a policy decision in April 2021 to manage solid and plastic waste through Public Private Participation (PPP) on each island.

The Village Panchayat on each Island has been appointed as "Local Body" under Solid Waste Management Rules, 2016.

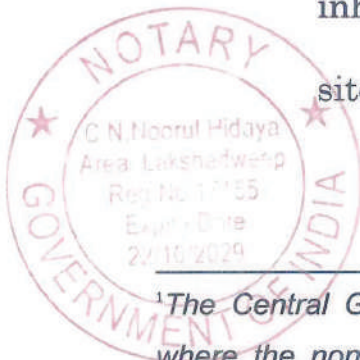


The entire process of waste management comprises 3 stages, which are:

- i. Door-to-Door Collection, Segregation and Internal Transportation to the Central Garbage Depository (CGD)¹
- ii. Packing and Transportation of segregated waste to the mainland; and
- iii. Recycling of the Waste at the Mainland.

16. The Lakshadweep Administration has assigned work for the above parts to agencies, and the same is explained below:

- i. **Agencies for Door-to-Door Waste Collection, Segregation and Transportation to CGD:** The Department of Panchayat has engaged agencies for Door-to-Door waste Collection, Segregation and Transportation to Central Garbage Depository Site (CGD) in each of the 10 inhabited islands. The Central Garbage Depository (CGD) site is used as a segregation area for the segregation of



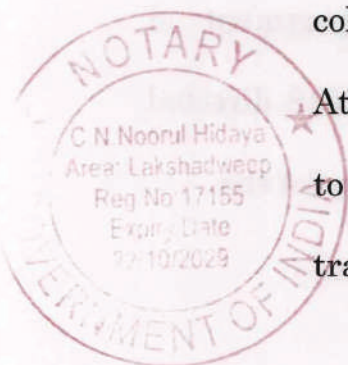
¹The Central Garbage Depository (CGD) is an identified location in each island, where the non-biodegradable waste is transported to, secondary segregation (to recyclable and incinerable waste) carried out, and then the recyclable waste is packed for further transportation to the mainland for recycling

non-biodegradable waste into recyclable and incinerable waste in the islands.

i. **Packing and Transportation of the segregated waste to the mainland:** The segregated recyclable waste is then packed and transported to the mainland. The Packaging and Transportation contracts in all the islands have been finalised by the Department of Panchayat. A copy of the authorisation dated 30.10.2023 issued by one of the Village Panchayats, viz, Kadmat for providing service of Packing and Transportation of Segregated Recyclable materials from Central Garbage Depository, Kadmat and its shipment and delivery to Recycling Treatment Facility at mainland, is at **ANNEXURE A/3**.

ii. **Recycling of the Waste at the Mainland:**The Department of Panchayat has also entered into a contract with a recycler at Calicut, Kerala, to receive recyclable waste transported from all the islands. Copy of the authorisation dated 29.09.2023 issued by the Department of Panchayat to collect/purchase all recyclable waste is at **ANNEXURE A/4**.

At present, about 1375 MT of waste from all islands remains to be transported to the recycler, primarily due to transportation challenges during the monsoon season (15th

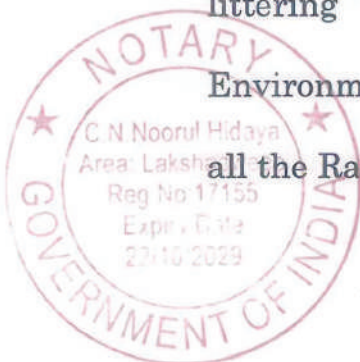


May to 15th September) and the inability of the existing recycler to handle the waste. To address this backlog and expedite recycling, the Department of Panchayat has floated a tender to engage multiple recyclers.

- iii. **Incinerators:** Considering that a part of the Non-Biodegradable waste is incinerable, two Municipal Solid Waste Management incinerators of a capacity of 100 Kg/hour were also installed in the islands of Kavaratti and Agatti during the year 2019-2020 for the incineration of incinerable waste generated in islands. At present, 1925 MT of waste in all islands remains to be incinerated, primarily due to the limited capacity of the incinerators. To address the challenge, the Department of Panchayat has decided to install Incinerators of capacities 100/50/20 Kg/hour (based on the quantity of incinerable waste) in the remaining 8 islands for which tenders have been invited.

PROHIBITION ON BURNING AND LITTERING OF WASTE

17. The UTLA has been issuing directions to prevent the burning and littering of waste from time to time. The Department of Environment and Forest vide its order dated 17.12.2018 directed all the Range Forest Officers and the Executive Officers of the



Village Panchayats to ensure that there is no burning/littering of solid waste under their jurisdiction, and to sensitise the stakeholders against illegal burning of solid waste.

18. That, further, clause 3 of the Lakshadweep Solid Waste Management Byelaws, 2018, mandates *inter-alia*:

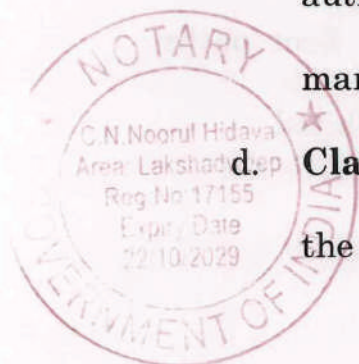
a. **Clause 3(a)** Tender coconut, tree leaves, coconut, husk, trunks etc in and around dwelling place/public places must be disposed scientifically by the landowner without affecting hygiene to the environment. No person is allowed to throw or break or spread coconuts, fruit leftovers, vegetable waste on roads, footpaths, common, public areas, Lagoon, sea, and the beaches.

b. **Clause 3(c)** Disposal by burning of any type of solid waste, at roadsides, beaches, and in open spaces is prohibited.

c. **Clause 3(e)** The organiser of a public event/gathering, shall clean the hired hall/ground within 24 hours from the event.

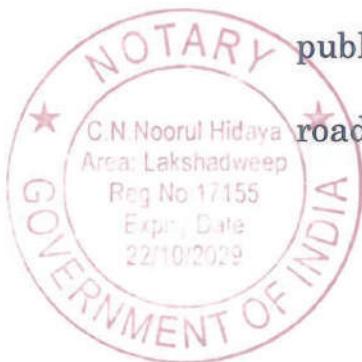
If the occupier of a generator fails to comply, the competent authority has power to clear and treat waste in any suitable manner and impose fines on the defaulters.

d. **Clause 3(f)** All the Resident territory limit should maintain the peripheral area of 25 m radius of their household litter



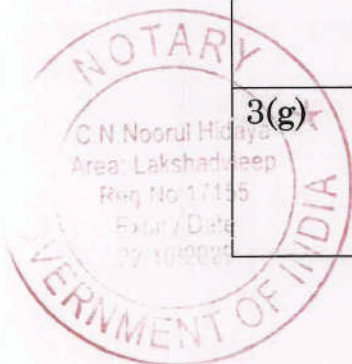
free or else responsibility shall be fixed on the dwelling house owner/Resident if found littered.

- e. **Clause 3(g)** No person shall dump, deposit, discharge, spill or release, solid waste, or cause or permit, such waste to be dumped, discharged, spilled or released, whether or not the wastage in a container, or receptacle, in, or any place, whether publicly/privately owned, including, but not limited to vacant, land, beaches, Lagoon, sea, drains etc. Except in a container or other at a place, which has specifically been indicated, provided or set apart for such purpose.
- f. **Clause3(h)** No person, while driving a vehicle, or while being conveyed in a vehicle, throw or deposit, solid waste on any public road or in any private premises with the limit, and no driver of a vehicle shall allow or permit any passenger in such vehicle to throw or deposit such waste in like manner. The vehicle driver will be responsible for such a violation and is liable for fine, or prosecution.
- g. **Clause3(o)** Dumping and littering of solid waste in any public place and any other area viz beaches. Foot paths, road, lagoon etc. meant for public utility is prohibited.



Schedule I of the Byelaw further prescribes penalties for the above as follows:

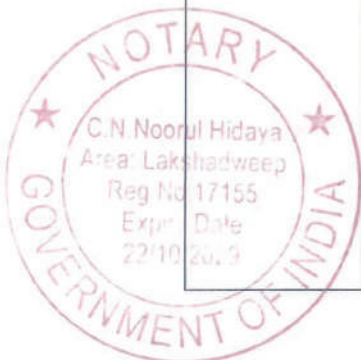
Clause	Subject of contravention/ violation	Fine for every single attempt of violation in Rupees
3(a)	To throw or break or spread coconut, fruit leftovers, vegetable wastes in public areas.	Rs. 200/-
3(c)	Disposal by burning of any type of solid waste at road sides/ beaches/ open places etc.	Rs. 500/-
3(e)	Failure of organisers of a public event/ gathering to clean the hired hall/ground within 24 hours of the event.	Rs. 5000/-
3(f)	Failure to clean peripheral area of 25 metre radius and to maintain it litter free around dwelling house.	Rs. 500/-
3(g)	Dispose solid waste outside the storage containers specifically	Rs. 500/-



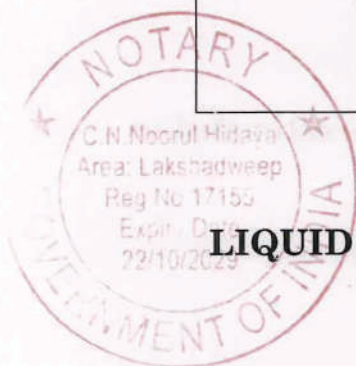
	indicated, provided or set apart for such purpose	
3(h)	Throw solid waste from vehicle to public place	Rs. 500/-
3(o)	Dumping and littering of solid waste in any public place	Rs. 500/-

19. That, with the promulgation of the Lakshadweep Panchayat Regulation, 2022, the UTLA has now notified the Lakshadweep District/Gram Panchayat Solid Waste (Handling and Management) Byelaws, 2024. Schedule I of these Byelaws similarly provides fines for littering and burning, as tabulated below:

No. of Byelaw	Sub-division/ Description of Rule/ Byelaw	Fines for upto first 5 offences *(except for 5.1, which shall be fine applicable	Further repeated offense (6 th offense onwards)



		for first offense)	
5.1	Littering in/or on any public/ private place	Rs. 50/-	Rs. 500/-
5.2 & 5.3	Littering from Vehicles/ Littering from waste carriage vehicles	Rs. 50/-	Rs. 500/-
6.12	For burning waste	Rs. 250/-	Rs. 2500/-
7.5	Putting waste at non-specified places	Rs. 100/-	Rs. 1000/-
8.6	For not cleaning – up after public gathering/ event within 4 hours	Forfeiture of cleanliness deposit of Rs 1000/- in case of littering	
10.1A	Facemask littering in/ or on any public/ private place	Rs. 500/-	Rs. 1000/-



LIQUID WASTE MANAGEMENT

20. The Union Territory of Lakshadweep has no city/town/urban local body, and it comprises only rural areas with the liquid waste majorly generated from households. The islands also do not have any major industries or factories. There is no large-scale sewage/liquid waste generated in Lakshadweep.

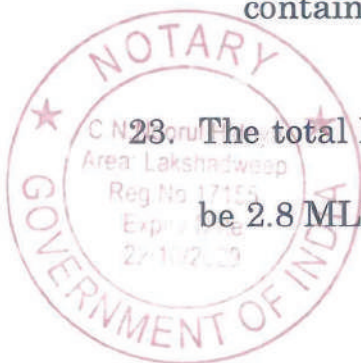
21. The main source of sewage on the island includes individual households, private commercial establishments and government establishments. All these establishments in Lakshadweep have **septic tanks and soak pits for faecal waste and separate soak pits for non-faecal wastewater management**. UTLA has also provided **1618 Bio-Digesters** in three islands of Andrott, Kavaratti and Bitra.

22. The Liquid Waste consists of:

a. Grey Water: from bathing, utensil and cloth washing, cleaning of floors etc. which do not contain significant pathogens

b. Black Water: (with faecal sludge): discharged from toilets containing human excreta, flush water and urine.

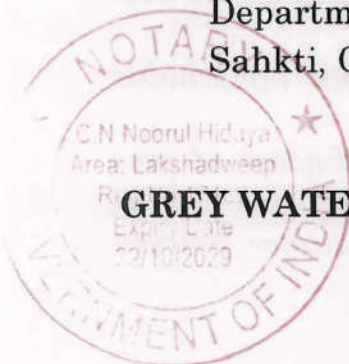
23. The total liquid waste generated in Lakshadweep is estimated to be **2.8 MLD**, as tabulated below:



No.	Name of the Island	Total Population (census 2011)	Estimated sewage generation (in MLD)		Total (MLD)
			Grey Water	Black Water	
1.	Agatti	7560	0.21	0.12	0.33
2.	Amini	7656	0.22	0.12	0.34
3.	Androth	11191	0.32	0.17	0.49
4.	Bitra	271	0.007	0.003	0.01
5.	Chetlat	2345	0.07	0.03	0.10
6.	Kadmat	5389	0.16	0.08	0.23
7.	Kavaratti	11221	0.32	0.17	0.49
8.	Kalpeni	4419	0.12	0.07	0.19
9.	Kilthan	3947	0.11	0.06	0.17
10.	Minicoy	10474	0.30	0.16	0.46
TOTAL		64473	1.84	0.98	2.82

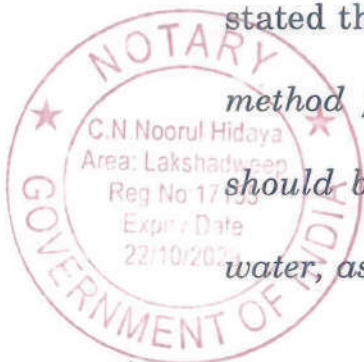
(Data Estimated based on Manual Grey Water Management, Department of Drinking Water and Sanitation, Ministry of Jal Sahkti, Government of India)

GREY WATER MANAGEMENT IN LAKSHADWEEP:



24. The water is generally discharged into the ground through a soak pit or used in Kitchen Garden. Ultimately, this water reaches the ground after natural sand filtration. In UT of Lakshadweep, there are two types of sand beds noticed, one with 20 to 50 cm hard strata (Coral rock) and the other without hard strata. The natural filtration is effective in the first case, and hence the grey water from these areas can be managed through soak pits. Traditionally, the construction of dwelling units in the islands was in areas having hard strata. The filtered water ultimately reaches the groundwater aquifer, and the groundwater is used for purposes other than drinking and cooking like bathing/washing (reuse).

25. That, as per a study report by the Water, Sanitation and Hygiene (WASH) Institute, the stagnation of grey water was not observed owing to the fast percolation of water in the sandy soil. It was also observed that there is insufficient data to show any impact of greywater on the groundwater in the islands. It further stated that *“Onsite Grey Water Management seems to be the best method for the household in the islands, and that households should be encouraged to use kitchen gardens to dispose of grey water, as kitchen garden maximizes the vertical distance between*



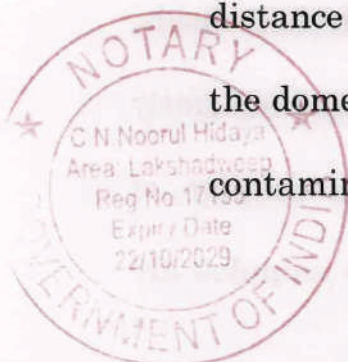
the point of disposal and groundwater, thereby increasing the pathogen reduction”.

BLACK WATER MANAGEMENT IN LAKSHADWEEP

26. This is done through septic tanks present in each household.

These tanks consist of 2 or 3 chambers followed by a leach pit arrangement. The depth of these septic tanks varies between 1-2 meters below the ground level. The leach pits are structures meant for discharging the effluent from the septic tank into the ground. Previously, the septic tanks constructed by the individuals in the UT were not sealed at the bottom. The UTLA accordingly initiated awareness programs for the people to ensure that the septic tanks are sealed at the bottom. The faecal sludge is de-sludged periodically by the Households through private de-sludging operators. UTLA also provided and installed 1618 Bio-Digestors as an Onsite sanitation system in 3 islands of Kavaratti, Andrott & Bitra.

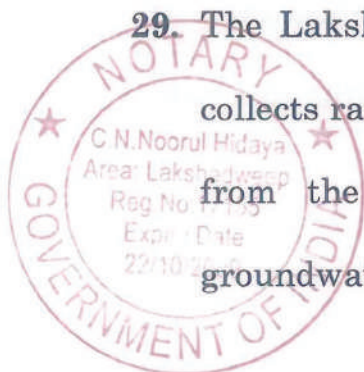
27. That, in a few households, due to limited land availability, the distance between the leaching chamber of the septic tank and the domestic water source (open well) is close, leading to a risk of contamination.



ESTABLISHMENT OF WATER QUALITY TESTING LABORATORIES

28. That, in view of above, UTLA has a comprehensive system for periodic random sampling and testing of groundwater. Nine block-level Water Quality Testing Laboratories were established in the 9 inhabited Islands during 1990-1998 for testing drinking water quality. Bitra Island comes under the jurisdiction of Chetlat Laboratory. These Water Quality Testing Laboratories have the facility for the measurement of parameters like Temperature, Colour, Taste, Odour, Turbidity, pH, Electrical Conductivity, Total Dissolved Solids, Total Alkalinity, Chloride, Fluoride, Nitrate, Sulphate, Total Hardness, Calcium Hardness, Magnesium Hardness, Total Coliform Bacteria and E.Coli/Thermo tolerant coliform bacteria. Each laboratory has a Chemist, Laboratory Assistants and Helpers. All the islands have been supplied with field testing kits, and ASHA workers have been trained in their use.

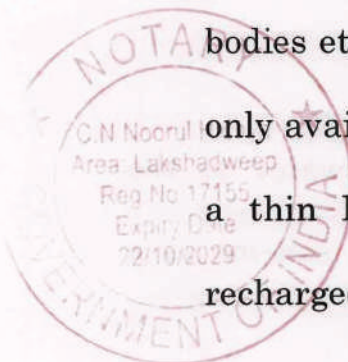
29. The Lakshadweep Public Works Department, on a daily basis, collects random samples from the 14082 Dug wells and quarterly from the 726 observation posts to assess the quality of groundwater, including seasonal variations. These samples are



tested in the Water Quality Testing Laboratories to check for contamination. It has been observed from these sample tests that **almost all the sample parameters are within the prescribed limits as per chemical and bacteriological bathing water standards.** As per a study done by the **Lakshadweep Public Works Department, 94% of the well water meets bathing quality standards.** In case any sample is found to have bacteriological contamination, the concerned household is immediately informed of the same and remedial measures like disinfection through chlorination of the well are carried out., followed by follow-up tests to monitor the effectiveness of the disinfection efforts. Similarly, on discovery of chemical contamination (mostly hardness), households are advised to refrain from using the affected water source until the parameters reach the safe levels due to recharge.

SOURCE OF DRINKING WATER FOR ISLANDERS

30. There is no surface water source like lake, river, streams, water bodies etc, in any of the islands in the UT of Lakshadweep. The only available source is limited ground water which is floating as a thin lens over the brackish water. This water source is recharged with rainwater that percolates through the soil. The

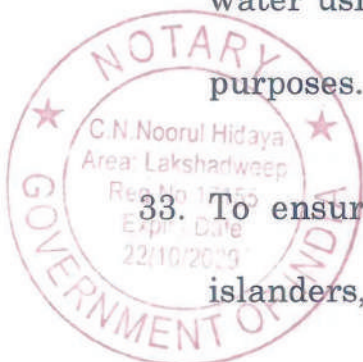


groundwater level fluctuates between pre-monsoon and post-monsoon periods as rainwater recharges the depleted groundwater source.

31. That, as almost 94% of the well water meets bathing quality standards and that some of the well water may not meet drinking quality standards, the UTLA has been pro-actively working to ensure that the inhabitants receive a minimum assured quantity of water fit for drinking, cooking and washing utensils.

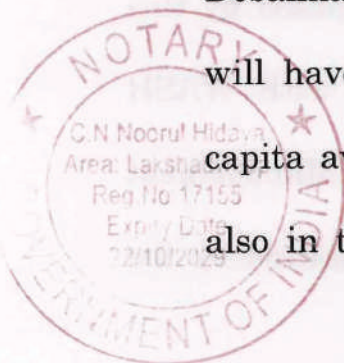
32. That, further, manually dug open wells have been the traditional method used by the islanders to obtain freshwater for their basic needs. Every household has a dug well, which is used for domestic purposes other than for drinking & cooking. 98% of the Households have their own internal water supply arrangement using dug wells. 94% of the Households have dug wells with bathing quality water. The Islanders have also been conserving water using step wells, ponds or tanks for washing and bathing purposes.

33. To ensure the availability of adequate potable water to the islanders, the UTLA introduced the water supply scheme as a



combination of Rainwater Harvesting (RWH) and Sea Water Desalination during the past few decades. The average rainfall in Lakshadweep is 1600 mm. 4561 Individual RWH tanks of different types (brick, ferro-cement and PVC) have been installed/constructed since the 1990s. That, 114 tanks have also been provided to Government Institutions such as Schools, Hospitals etc.

34. The Administration has also installed 8 Desalination Plants of 10.5 Lakhs litres per day total capacity in 8 islands based on the Low-Temperature Thermal Desalination technology developed by the National Institute of Ocean Technology, Chennai, and the same are functional. A Sea Water Reverse Osmosis Plant of 0.24 lakh litre capacity has also been installed in the smallest island of Bitra (with a population of 271). An additional Desalination Plant of 1.5 Lakh litre per day is also under installation at (the 10th inhabited) Andrott Island, and the same is likely to become functional by December 2024. With the installation of this Desalination Plant, all the inhabited islands in Lakshadweep will have water supply through Desalination Plants, with per capita availability varying from 7.7 lpcd to 79.6 lpcd. UTLA is also in the process of establishing an OTEC-based desalination

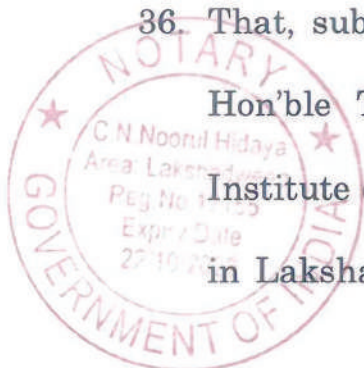


Plant in Kavaratti with a capacity of one lakh litre per day capacity. In addition, 5 more Desalination plants are proposed to be established in the next phase under the Jal Jeewan Mission of Govt. of India. The Ministry of Jal Shakti, Govt. of India, has also recommended the installation of an additional 22 LTDD plants, each with 1.5 lakh litre per day capacity in a phased manner till 2051. The desalinated water is being supplied through piped network and Household taps provided under the Har Ghar Jal Scheme of Govt. of India.

35. The objective of the above initiatives is to initially ensure the availability of 18 lpcd (3+5+10 for drinking, cooking and utensil washing) desalinated water to every household and 55 lpcd to those households that do not have bathing quality groundwater. With the installation of all 27 additional plants, all households will have access to 55 lpcd water.

**Reports by Water, Sanitation and Hygiene (WASH) Institute –
Establishment of Planted Drying Bed (PDB)**

36. That, subsequent to the order dated 23.04.2024 passed by this Hon'ble Tribunal, an online meeting was held with WASH Institute on 15.05.2024 to review the Liquid Waste Management in Lakshadweep based on the earlier reports submitted by the



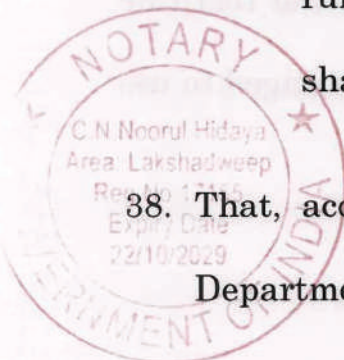
Institute. The WASH Institute made a detailed presentation, highlighting the following aspects with respect to Liquid Waste Management:

- i. Faecal Sludge Management in the Islands
- ii. Grey Water Management in the Islands
- iii. Current practices on drinking water
- iv. Proposed approach and solution for Faecal Sludge Management
- v. Treatment options like MBBR, MTU, PDB etc.
- vi. Action plan for implementing proposed solutions.

37. The Institute particularly highlighted the adoption of the Planted Drying Bed methodology for the treatment of faecal sludge considering the island conditions. That, during the meeting, it was *inter-alia* decided that:

- a) WASH Institute shall submit a comprehensive report on Liquid Waste Management in Lakshadweep islands.
- b) Officers from Lakshadweep shall visit any efficiently running Planted Drying Bed (PDB) plant. Wash Institute shall suggest the site for the visit.

38. That, accordingly, WASH Institute submitted a report to the Department of Drinking Water and Supply, Government of



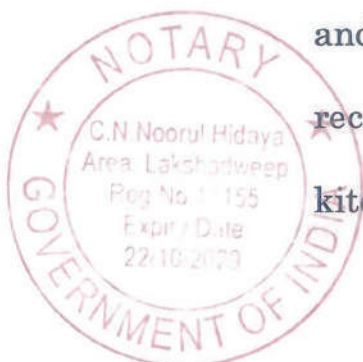
India, which then forwarded the report to UTLA on 30.05.2024.

The report stated the following scope of work:

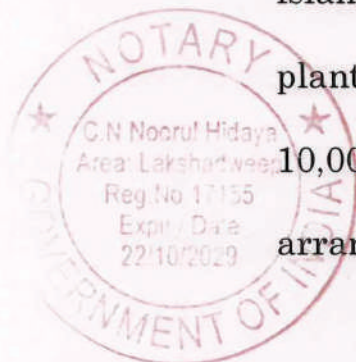
- a) Analyse the Liquid Waste Management context on the Island through visits and interactions.
- b) Review and discuss the FSM plan/ DPR draft
- c) Prepare an executive report on the context and changes, if any, to the prepared plan/ DPR.

39. The WASH Institute in its report, has *inter-alia* made the following major recommendations:

- i. **Septic Tanks:** Onsite sanitation systems such as single and twin pits need to be converted into septic tanks in areas where the groundwater table may rise to less than 3 meters below ground level (BGL). Further, for tanks with leach pits in areas where the groundwater table may rise to 1.8 meters BGL, the leach pit arrangement must be bypassed, and trenches above or partially buried should be created. The septic tanks should be installed with a pipe and gap access. For greywater management, the Institute recommended that households should be encouraged to use kitchen gardens.



- ii. **Technologies for Faecal Sludge Management:** The MBBR-based faecal sludge treatment plant design may not be effective in the context of Lakshadweep. Instead, a Planted Drying Bed (PDB) model of a faecal sludge treatment plant has been proposed. PDB drying bed model has a proven track record for ease of operation and low cost of ownership. It also requires a very basic skill set to operate. Model design for this technology is available in the FSSM manual published by the DDWS, Ministry of Jal Shakti, Government of India. An additional pathogen removal (disinfection) unit, such as an ultraviolet filter, can be included in the design to reduce any chance of groundwater contamination from treated water. Anaerobic digestion modules can be considered a primary treatment prior to Planted Drying Beds if the Total Volatile Solids /Total Solids ratio in the faecal sludge is > 60%. Vehicle-mounted Mobile Treatment Units can be considered for islands where acquiring land for faecal sludge treatment plants is an issue and where the population is greater than 10,000. However, sufficient additional spares need to be arranged to ensure seamless operation of the unit.



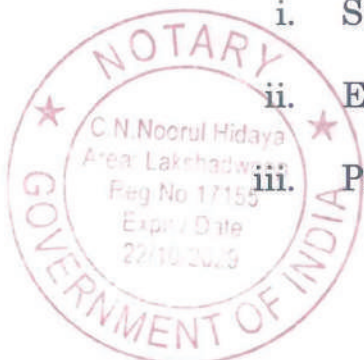
iii. **Bio-digestors** need to be adopted after careful consideration.

40. The above mentioned recommendations made by the WASH Institute were examined by the Technical Sub-Committee consisting of Dr. Girish R. Pophali, Chief Scientist, NEERI, Nagpur, Dr. Anas Abdul Aziz, Scientist, CSIR-NIO, Kochi, Dr. Robin R.S., Scientist, NCSCM, Chennai and Shri C.N. Shajahan, Superintending Engineer, Lakshadweep Public Works Department, which then furnished its remarks on the recommendations. These recommendations and the remarks were then placed before the HLMC during its meeting held on 23.08.2024, based on which the following major decisions were taken by the Committee:

NEW DESIGN FOR SEPTIC TANKS

41. That, in the first meeting of HLMC held on 06.06.2024, a presentation was made by the Department of Science and Technology, highlighting the following issues:

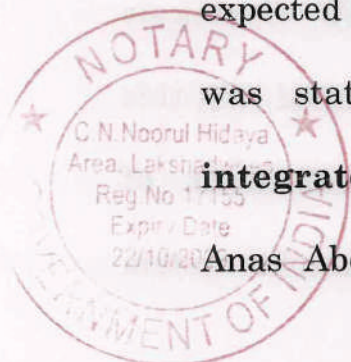
- i. Status of Liquid Waste in Lakshadweep
- ii. Estimated Liquid Waste Generation
- iii. Present Practices



- iv. Test results of the samples analysed for greywater, septic effluents and groundwater for understanding various quantitative and qualitative characteristics
- v. Recommendations of WASH Institute
- vi. Recommendations of Centre for Water Resources Development & Management (CWRDM) studies

42. It was briefed to the external technical members that the Lakshadweep Administration requires expert suggestions/advice in the field of Liquid Waste Management for preparing an efficient Waste Management Action Plan (especially for grey and black water management). After detailed deliberations, it was inter-alia decided that a uniform design for septic tanks needs to be implemented across the households through Panchayat to improve the quality of discharge.

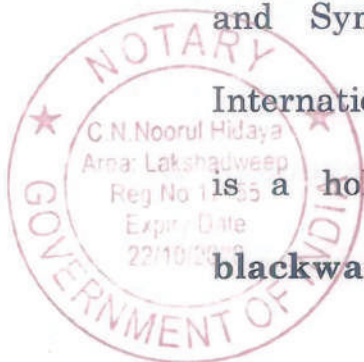
43. Thereafter, in the 2nd meeting of the HLMC held on 05.07.2024, a detailed presentation was made by Dr Girish R Pophali, Chief Scientist, CSIR-NEERI Nagpur on Schematic design and expected performance of Engineered Natural Sewage System. It was stated that it is a modified anaerobic system with **integrated black water and grey water management**. Dr. Anas Abdul Azeez, NIO, Kochi mentioned that the proposed



system is an appropriate system for Lakshadweep Island conditions. Dr Robin R S, Scientist, NCSCM, suggested that the decentralised system is better than the centralised system for Lakshadweep Island conditions. That, after a detailed discussion, it was decided that the Technical Members of the committee shall submit a joint report with the approval of the Director, NEERI, Nagpur. On the basis of the discussion, the Technical Members submitted a joint report on 20.08.2024, and the said report was considered by the HLMC in its 3rd meeting held on 23.08.2024.

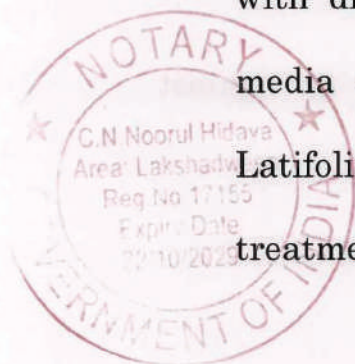
A copy of the joint report dated 20.08.2024 submitted by the Technical Members is annexed herewith and marked as **ANNEXURE A/5**.

44. That, as per the report, the concept of an Engineered Natural Sewage Treatment System (ENSETS) has been successfully implemented on the full scale at Ordnance Factory Ambajhary Nagpur, MOIL Ltd. Gumgaon, Nagpur, Dayanand Park, Nagpur and Symbiosis Institute of Technology (SIT), Symbiosis International University (SIU), Pune. It was explained that this is a holistic approach for the **combined treatment of blackwater and greywater**, consisting of the anaerobic system



followed by constructed wetlands. It was further explained that ENSeTS is a natural sewage treatment system that requires minimum operation and maintenance, including skilled manpower, chemicals and energy. It provides natural treatment to sewage through an anaerobic system and constructed wetlands and helps in attaining the treated effluent quality according to the latest prescribed discharge standards (NGT Norms). Treated effluent can be reused for non-potable purposes including gardening, green belt development toilet flushing etc

45. It was also explained in the report that the ENSeTS consists of pre-treatment i.e. screening and removal of oil & grease in drains, followed by anaerobic systems and horizontal subsurface flow constructed wetlands. The anaerobic system consists of settling cum digestion of solids, an anaerobic baffled reactor and then an up-flow anaerobic filter. Anaerobic filters are placed with some filter media having a specific surface area of 150 – 200 m²/m³. Subsurface horizontal flow constructed wetlands are filled with different gradations of river bed or crushed stone filter media and planted with locally available species of Typha Latifolia and ornamental plants, Canna Indica. Anaerobic treatment ensures substantial removal of organic matter present

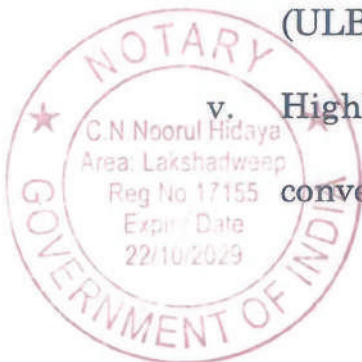


in sewage, whereas constructed wetlands ensure removal of residual organic matter, fine colloidal particles and nutrients. Though constructed wetlands substantially remove TC & FC, chlorine disinfection is recommended in order to prevent groundwater contamination.

46. It was stated in the report that both anaerobic systems and constructed wetlands are natural processes and have the following advantages:

- i. They are less energy-intensive and highly efficient in removing organic and nutrient loading respectively.
- ii. Easy to operate and do not require highly skilled manpower.
- iii. Overall O&M costs are very low since anaerobic systems also produce biogas and no chemicals are required in overall treatment.
- iv. Suitable for decentralised sewage management applications in housing complexes, urban local bodies (ULBs) and Institutions etc.

v. Highly sustainable and adds to aesthetics as against conventional sewage treatment plants.

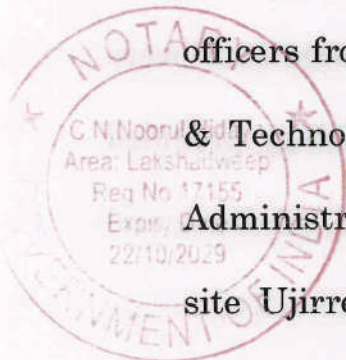


47. The design details and drawing plan, including section, and cost estimates based on DSR 2023, of ENSeTs were also furnished as part of the report by the Technical Sub-Committee.
48. That, after the detailed discussions in the 3rd HLMC meeting, it was inter-alia decided that LPWD shall construct 5 new ENSeTS in the various islands of Lakshadweep as a pilot project. The PWD has now invited tenders for nine new Septic Tanks as per the ENSeTS technology.

Implementation of Planted Drying Bed for Faecal Sludge Management

49. The WASH Institute in its report has stated that the MBBR based faecal sludge treatment may not be effective in the context of Lakshadweep. Instead, it has stated that a Planted Drying Bed model of a faecal sludge treatment plant is proposed for all islands in Lakshadweep.

50. That, in pursuance of the earlier decision taken during the presentation made by WASH Institute on 15.05.2024, a team of officers from the Departments of Environment & Forest, Science & Technology, and Public Works Department of Lakshadweep Administration made a visit to the Planted Drying Bed (PDB) site Ujirre Panchayat, Dakshina Kannada District, Karnataka



on 23-27th July 2024. The team submitted its report on 12.08.2024.

51. The above report of the Team of Officers from Lakshadweep was presented before the HLMC in its 3rd meeting held on 23.08.2024. The HLMC decided to implement the PDB system on an experimental basis in Minicoy Island, for which the WASH Institute has been requested to assist UTLA in the preparation of the RFP. Based on this decision, the Lakshadweep Public Works Department has approached WASH Institute and its representatives have visited Lakshadweep. The WASH Institute is now preparing the RFP for the implementation of PDB in Minicoy Island.

Implementation of Bio-Digestors in Lakshadweep

52. The Hon'ble Tribunal vide its order dated 17th November 2022 had inter-alia observed that there is need to design and adopt methods evolved by DRDO on bio-toilets/bio-digesters, following safe usage of digested material.

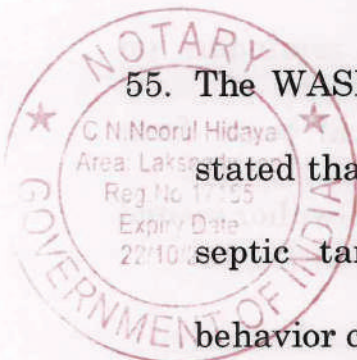
53. That, it is humbly submitted that 1618 Bio-Digestors were installed in UT of Lakshadweep as per the technology provided by DRDO during the year 2012- 2014 in Kavaratti, Androth and



Bitra islands. It is also worthwhile to mention that Bitra Island is fully saturated with Bio-toilets.

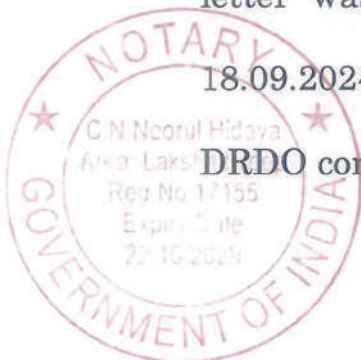
54. Further, a study was also conducted by the Centre for Water Resources Development and Management (CWRDM), Kozhikode (a research organization under the Government of Kerala) on the “*Long term impact of the installation of bio-toilets in the ecology of Lakshadweep based on the existing biodigesters installed at Kavaratti, Androth and Bitra islands*” during June, 2019. The report concludes that the Biodigester is a good option in Lakshadweep island conditions. The efficiency of some of the well-maintained Biodigester plants is meeting the standards of CPCB. It was suggested to give proper detailed training to households for using the bio-toilets. Furthermore, proper advice should be given not to use chemicals in cleaning toilets since the presence of chemicals can kill microbes that help the degradation of faecal matter. The overflow from the biodigesters should also be prevented.

55. The WASH Institute in its report submitted in May, 2024, has stated that Bio-Digesters are also an alternative to conventional septic tanks. However, since they require a fundamental behavior change in the type of toilet (pedestal as compared to the



pan) and the usage of non-chemical cleaning agents (which are currently not easily available on the island), they should only be adopted after careful deliberation by the local authorities. In any case, the bio-digester toilets need to have an effluent treatment/dispersal mechanism.

56. That, after considering all facets, it was decided to have a meeting with the Defense Research and Development Organization (DRDO). Accordingly, a meeting was held on 01.08.2024 wherein the DRDO made a presentation on High-Performance Biodigester Technology (HPDB). The HLMC, in its 3rd meeting held on 23.08.2024, also decided that UTLA shall implement the Bio-Digester system on a pilot basis with the assistance of DRDO. In the meeting held with DRDO on 01.08.2024, it was also decided that a technical team of scientists/ officials from DRDO/DRDE shall be deputed to Lakshadweep to study the feasibility of introducing the HPBD Biodigesters with respect to Lakshadweep island conditions. A letter was sent to DRDO on 05.08.2024, with reminders on 18.09.2024 and 26.09.2024. Thereafter, a technical team from DRDO consisting of senior scientists from DRDE, Gwalior visited

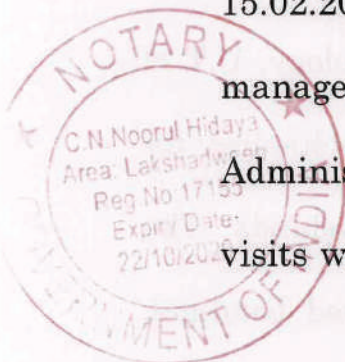


UT of Lakshadweep on 15th – 18th October 2024. The report of the technical team is awaited.

Implementation of a Mobile Treatment Unit (MTU) in Lakshadweep for Faecal Sludge Treatment

57. It is humbly submitted that a meeting was held under the chairmanship of Union Home Secretary on 14.02.2023, in compliance with the order dated 17.11.2022 passed by this Hon'ble Tribunal in regard to the compliance of Municipal Solid Waste Management Rules, 2016 and other environmental issues related to UT of Lakshadweep. In the meeting, it was decided that alternative technologies for faecal sludge management may also be explored by the UT Administration. In this context, a team of technical experts from the WASH Institute were deputed to visit Lakshadweep by the Department of Drinking Water & Sanitation (DDWS) in that month itself to assist the UT Administration.

58. That, DDWS advised WASH Institute vide letter dated 15.02.2023 to undertake assessment options for faecal sludge management in the islands of Lakshadweep and advise the UT Administration appropriately. As advised by the Ministry, field visits were carried out by the WASH Institute team between 7th

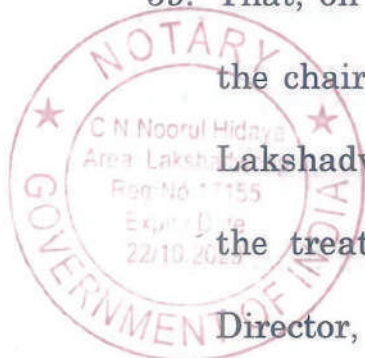


– 11th March, 2023 to Kavaratti, Agatti and Kadmat islands. The WASH Institute submitted its report to the DDWS. The Director, DDWS vide his email dated 24.08.2023 requested WASH Institute to submit a more detailed report which should also include details of Mobile Treatment Unit (MTU) technology. It was further stated that the report shall also give information about the following aspects:

- i. Land requirement for each of the technology options, both for the centralised single unit and island-wise breakup.
- ii. Financial implication i.e. Capex and O&M etc. both for the centralized single unit and island-wise break up.
- iii. Pros and cons of each treatment option.

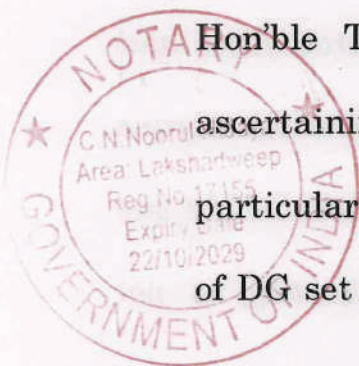
Accordingly, WASH institute submitted the report while drawing a comparison between technologies such as MBBR system, PDB and MTU.

59. That, on receipt of the above report, a meeting was held under the chairmanship of the Director, Science & Technology, U.T of Lakshadweep on 22.09.2023 to identify a suitable technology for the treatment of faecal sludge in Lakshadweep islands. The Director, Panchayat, UT of Lakshadweep also visited Dindigal,



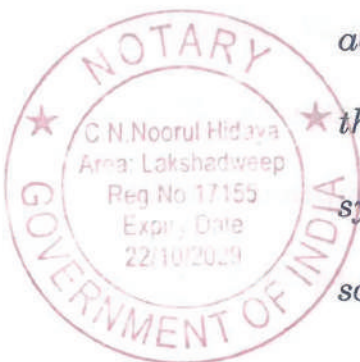
Tamil Nadu, on 20.09.2023 for the purpose of seeing the demonstration of the Mobile Septage Treatment Unit (MTU) and Sewage Treatment Plant (STP). The committee constituted to identify the suitable technology for the treatment of faecal sludge in Lakshadweep islands, based on the report submitted by WASH Institute and the visit of the Director (Panchayat) to Dindigul, recommended that the Mobile Septage Treatment Unit (MTU) is viable solution in the fragile ecosystem of the island conditions and to procure Mobile Septage Treatment Unit (MTU) for each island except Bitra. The recommendation of the Committee was approved by the Secretary (S&T), and action was initiated to invite the tender to procure one number of MTU on an experimental basis. Accordingly, the tender for Supply, Installation, Testing, Commissioning, Operation and Maintenance (SITCO&M) for 1 number of MTU for Kavaratti was floated, and a work order has been issued on 04.11.2024.

60. It is also submitted that in pursuance of the directions of this Hon'ble Tribunal vide its order dated 23.04.2024 regarding ascertaining operational and Performance details of MTU, particularly its feasibility because of power consumption and use of DG set for power requirement, the matter was taken up with



the WASH Institute. It was informed by the WASH Institute that:

- i. *A Technical Committee, chaired by the Principal Scientific Adviser to the PM, Govt of India, has vetted and approved the MTU. MTU is also listed on Jal Jeevan Mission website under PSA approved technologies. Technical Committee constituted by Ministry of Housing and Urban Affairs (MoHUA) vetted the MTU under their Global Technology Challenge (4th July 2018 to 14th August 2018) and issued a DO letter to the states and ULBs advising them to use MTUs as one of the options for emptying and treating septage. In 2022, MTU was included under Swachh Bharat Kosh (SBK) by Department of Drinking Water and Sanitation, Ministry of Jal Shakti in SBM G.*
- ii. *In the MTU, the liquid after being separated from the solid, passes through a series of filters such as sand, activated carbon, 10-micron filter, 1 micron filter and then finally through 0.2 micron ultra filter membrane system and the treated effluent is disposed on the site safely (kitchen garden/ Open drain). Testing is not*

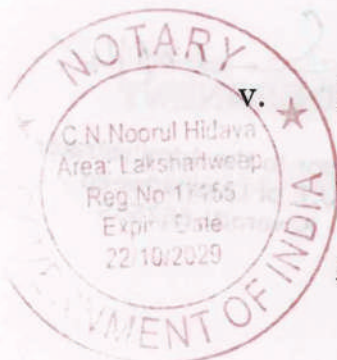


required before the discharge. It is to be noted that the treated liquid conforms to the CPCB standards.

iii. It is to also be noted that the discharge of the MTU is much less compared to a typical sewerage system and treatment plant. As opposed to a typical daily consumption of 135 lpcd and a proportionate discharge, a septic tank may contain about 6000 Liters of septage which is processed once in 5 years or more.

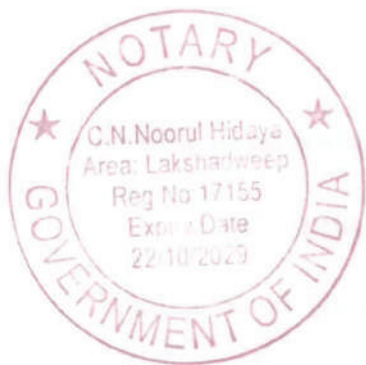
iv. The retained solids, which constitute less than 1% of total volume of the treated septage, may be co composted along with biodegradable household solid waste or briquetted and used as an alternative for charcoal. Alternatively, it can be safely managed by way of composting at existing STPs or other sludge handling facilities. The quantity of solids from a septic tank of 6000 liters will be around 60 Kg (dry) (once in 5 years or more).

v. MTU has been designed to run on single-phase power supply that is normally available in the households. The power consumption for its operation would be 3-5 units



per septic tank of 6000 Liters which can be emptied in one hour. Hence, power supply may be taken from individual households where the MTU is being deployed for desludging. Diesel Generator set arrangement is typically not required as the desludging can be scheduled when power is available

61. The UT of Lakshadweep Administration is undertaking all measures to comply with the directions passed by this Hon'ble Tribunal from time to time. Further, the UT of Lakshadweep Administration craves leave of this Hon'ble Tribunal to file a more detailed status report as and when directed by this Hon'ble Tribunal.
62. That the annexures annexed to the present report are true copies of their respective originals.
63. That the present report is bonafide and in the interest of justice.



EXECUTED & SIGNED IN MY PRESENCE
ON 05/11/2024 AT LAKSHADWEEP

ATTESTED

C.N. Noorul Hidayah
C.N. NOORUL HIDAYA
ADVOCATE & NOTARY

GOVT. OF INDIA, Area: Lakshadweep
Reg.No:17155, Expiry Date:22/10/2029

[Signature]
DEPONENT

Advisor to the Administrator
U.T. of Lakshadweep
Kavaratti-682555

VERIFICATION

Verified at KAVARATTI on this 5th day of November, 2024, that the contents of the above affidavit are true and correct to my knowledge and belief. No part of the same is false and nothing material has been concealed.



EXECUTED & SIGNED IN MY PRESENCE
ON 05/11/2024 AT LAKSHADWEEP

ATTESTED
[Signature]
C.N. NOORUL HIDAYA
ADVOCATE & NOTARY
GOVT. OF INDIA, Area: Lakshadweep
Reg.No:17155, Expiry Date:22/10/2029

[Signature]
DEPONENT

Advisor to the Administrator
U.T. of Lakshadweep
Kavaratti-682555



लक्षद्वीप प्रशासन /LAKSHADWEEP ADMINISTRATION
 विज्ञान एवं प्रौद्योगिकी विभाग /DEPARTMENT OF SCIENCE & TECHNOLOGY
 कवरत्ती द्वीप- 682 555/ KAVARATTI ISLAND -682 555
 E-mail: lk-dst@nic.in

File No: 15/1/2024-S&T (Part-1)

Dated: 18 .05.2024

ORDER

A 'High Level Monitoring Committee on Liquid Waste Management and other environmental matters in UT of Lakshadweep', is hereby constituted, with following composition:

- | | |
|--|--------------------|
| 1. Advisor to the Hon'ble Administrator | - Chairman |
| 2. Secretary (Panchayat) | - Member |
| 3. Secretary (Lakshadweep Public Works Department) | - Member |
| 4. Secretary (Environment & Forests) | - Member |
| 5. Secretary (Information Technology) | - Member |
| 6. Secretary (Port, Shipping & Aviation) | - Member |
| 7. Secretary (Power) | - Member |
| 8. Secretary (Science & Technology) | - Member |
| 9. Secretary (Industries) | - Member |
| 10. Secretary (Health) | - Member |
| 11. Dr. Anas Abdul Aziz, Scientist, CSIR- NIO, Kochi | - Technical Member |
| 12. Dr. Girish R. Pophali, Chief Scientist, CSIR-NEERI, Nagpur | - Technical Member |
| 13. Dr. Robin R.S, Scientist, NCSCM, Chennai | - Technical Member |

2. The Chairman may invite any Departmental Head as required from time to time.

3. This is issued with the approval of Advisor to the Hon'ble Administrator, UTL vide diary No.751 dated 18 .05.2024.


 (Himanshu Yadav)
 Director, S&T

To
 The Concerned

Copy to:

1. PA to the Advisor to the Hon'ble Administrator, UTL
2. PA to the Secretary, (Science & Technology)
3. Director, NCSCM, Chennai
4. Director, NEERI, Nagpur

ANNEXURE - A/2

STATUS AND PERFORMANCE REPORT OF BIO GAS UNITS (SEPTEMBER 2024)
KALPENI ISLAND

SL NO	Name and address of Bio gas Beneficiary	CAPACITY OF BIOGAS (IN M ³)	Inspected on	Usage of quantity of kitchen waste per day (In hours)	Usage of Bio gas for various cooking purpose per day (In hours)	Working Condition	Remarks
1	Hajarommabi CG Chemmengath	1 M ³	11-09-2024	5	2 to 3	Working	Fully Satisfied
2	Rubeena Beegum KI Kadapurathayillam	1 M ³	11-09-2024	5	2	Working	Fully Satisfied
3	Haseena Beegum KK Konjamkakkada	1 M ³	11-09-2024	4	1 to 2	Working	Fully Satisfied
4	BI MV Mathil Veliyamada	1 M ³	11-09-2024	5	2 to 3	Working	Fully Satisfied
5	Attakoya PP Perumpally	1 M ³	11-09-2024	5	2 to 3	Working	Fully Satisfied
6	Kunhibi CG Chemmengath	1 M ³	12-09-2024	4	2 to 3	Working	Fully Satisfied
7	Rahmabi CN Cheriyanallal	1 M ³	12-09-2024	4	1 to 2	Working	Fully Satisfied
8	Beefathummabi K Kundari	1 M ³	12-09-2024	5	1 to 2	Working	Fully Satisfied
9	Valiyabi TP Thithiyappada	1 M ³	14-09-2024	5	2 to 3	Working	Fully Satisfied
10	Mohammed NisafarudheenAK, Akkara	1 M ³	14-09-2024			Not Working	Plant needs Maintenance


Technical Assistant
 Science & Technology
 Kalpeni 692557

11	Muneerabi KI Kakkillam	1 M ³	15-09-2024	5	2 to 3	Working	Fully Satisfied
12	Hajarommabi AK, Akkara	1 M ³	15-09-2024	5	2	Working	Fully Satisfied
13	Mohammed Irfan KIN, Kakkaillam Nalakam	1 M ³	17-09-2024	4	1 to 2	Working	Fully Satisfied
14	Zahira BP, Biyyappada	1 M ³	17-09-2024	5	2 to 3	Working	Fully Satisfied
15	Beeefathummabi CG, Chemmengath	1 M ³	18-09-2024	5	2 to 3	Working	Fully Satisfied
16	Koya KIN, Kakkaillam Nalakam	1 M ³	18-09-2024	4	2 to 3	Working	Fully Satisfied
17	Mohammed Hanees KI, Kadapurathailam	1 M ³	19-09-2024	4	1 to 2	Working	Fully Satisfied
18	Yusuf Kc, Kuttiyachada	1 M ³	19-09-2024	5	1 to 2	Working	Fully Satisfied
19	Beebi NP, Nenempappada	1 M ³	21-09-2024	5	2 to 3	Working	Fully Satisfied
20	Subaidbai TT, Thaitthottam	2 M ³	21-09-2024	4	3	Working	Fully Satisfied
21	Hajorommabi MK, Malmikakkada	1 M ³	21-09-2024			Partially Damaged	Knob Assembly Damaged
22	Mariyambi CG, Chemmengath	1 M ³	21-09-2024	5	2 to 3	Working	Fully Satisfied
23	Suhrabi AK, Akkara	2 M ³	22-09-2024	6	3	Working	Fully Satisfied
24	Hajarommabi M, Mannel	1 M ³	22-09-2024	5	3	Working	Fully Satisfied


 Technical Assistant
 Science & Technology

25	Minnath KV, Kakkavaliyoda	1 M ³	23-09-2024	5	3	Working	Fully Satisfied
26	Mumthaz Beegum P, Pokkayoda	1 M ³	23-09-2024	5	3	Working	Fully Satisfied
27	Beefathummabi KK, Kunduvakkada	1 M ³	24-09-2024			Not Working	The Plant have been damaged Due to fallen of coconut tree
28	Sara MP, Meppally	1 M ³	24-09-2024	5	3	Working	Fully Satisfied
29	Muhsina CG, Chemmengath	1 M ³	24-09-2024	5	3	Working	Fully Satisfied


Technical Assistant
 Science & Technology
 Kalpeni - 682557

STATUS AND PERFORMANCE REPORT OF BIO GAS UNITS (SEPTEMBER-2024)

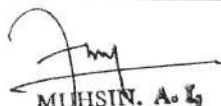
SL.NO	Name & address of Bio gas Beneficiary	Capacity of Bio gas (m ³)	Inspected on	Usage of quantity of kitchen waste per day (In hours)	Usage of bio gas for various cooking purpose per day (In hours)	Working condition	Remarks
01	Saida, Sabistha Nivas, Minicoy	1m ³	18/09/2024	-	-	Non-functional	Presently residents are in mainland. Therefore feeding is not happening.
02	Havva Beporekori, Minicoy	1m ³	18/09/2024	5	2- 3	Working	Fully Satisfied
03	GSSS, Minicoy	2m ³	18/09/2024	-	-	Non-functional	Midday meal preparation has been centralised and meals are prepared in Govt JB School, hence feeding is not happening.


(Jaseela TD)

TECHNICAL ASSISTANT
U.T. OF LAKSHADWEEP
MINICOY - 682 559

STATUS AND PERFORMANCE REPORT OF BIOGAS UNITS AT KAVARATTI ISLAND (SEPTEMBER, 2024)

S.NO	NAME & ADDRESS OF BENEFICIARY	CAPACITY OF BIOGAS UNIT (In m ³)	INSPECTION DATE	USAGE OF QUANTITY OF KITCHEN WASTE/DAY (In Kg)	USAGE OF BIOGAS FOR VARIOUS PURPOSE/DAY (In hours)	WORKING/NOT WORKING	REMARKS
1	Nishad Moolokepura Baithul Aska Near Barraks Kavaratti	0.75 m ³	12.09.2024	2	1.5	Working	Fully satisfied
2	Abdul Razak Thirinipura Near Puthiyapalli Kavaratti	1 m ³	12.09.2024	-	-	Not working	Problems in hose pipe connected to burner
3	Safiya Rabiyoada Rabiyoada House Kavaratti	0.6m ³	12.09.2024	-	-	Not working	Disconnected due to renovation of kitchen.


MUHSIN. A. I.
 Scientist
 Dept. of Science & Technology
 Lakshadweep
 Kavaratti-682 555



GOVT. OF INDIA
LAKSHADWEEP ADMINISTRATION
(OFFICE OF THE BLOCK DEVELOPMENT OFFICER)
KADMAT ISLAND – 682556.

D.No. 1830
6/11/2023
Annexure-A/3
SWS
04X123

52

F.No. 7/2/2023-VDP(Kdt) / 71

Dated 30.10.2023

WORK ORDER

Sub :- VDP, Kadmat Island – providing service of Packing & Transportation of Segregated Recyclable materials from Central Garbage Depository Kadmat, its Shipment and delivery to Recycling treatment facility at mainland under solid and waste management – Work order issued.

- Ref :- (1) NIT F.No.14/36/2022–DOP(SWM) Dated, 04.02.2023 of DOP, Kvtt.
(2) Letter of Intent F. No. 14/36/2022 – DOP (SWM)/830 Dated 28.9.2023.
(3) Note sheet approval F. No. 14/36/2022 DOP (SWM), dated 23.09.
(4) Service Level Agreement constituted dated 30.10.2023.
(5) The Order F.No.14/36/2022 DOP–(SWM) dated, 10.2023 of DOP.

With reference cited on the subject mentioned above, the Village Dweep Panchayat, Kadmat hereby issued work order to Shri. Ismail R.M, Kavaratti for providing service of Packing & Transportation of Segregated Recyclable materials from Central Garbage Depository, Kadmat, its Shipment and delivery to Recycling Treatment facility at mainland for a period of one year with provision for extension.

The total cost of 1,39,000/- lakh/month (Rupee One Lakh Thirty Nine Thousand) only approved for packing, transportation, shipment and delivery to Recycling Treatment facility at mainland as per the order cited 5th above. The payment will be released as per term & conditions mentioned in tender documents and Service Level Agreement. The tender will be valid from the date of execution of Service Level Agreement with the firm for one year or provision of extension as per bilateral agreements.

Service Provider shall be responsible for Packing, local transport for shipment, loading freight charges on shipment, unloading to mainland wharf and Transportation charges for vehicle from receiving port to treatment facility for recyclable used materials and delivery to their yard at the frequent intervals as per Provisional Work Schedule provided in Appendix – B, tender documents and Service Level Agreement. The payment will release only after the submission and satisfaction of documents as per Appendix C and term and conditions mentioned in tender document and Service Level Agreement.

This is issued with the approval of Secretary Finance vide diary No. 134, 23.09.2023 and Order F. No. 14/36/2022 – DOP (SWM) Dated, 10.2023 of Director, DOP

Executive Officer, VDP, Kadmat

(PTO)

To,

Shri. Ismail, Rahmath Manzil, Kavaratti

Copy to:-

1. The PA to Secretary (Panchayats), UTLA, Kavaratti for kind information, please.
2. The Director of Panchayats, UTLA, Kavaratti for kind information, please
3. The Chief Executive Officer, District Panchayat, UTLA, Kavaratti for kind information
4. The Block Development Officer, Kadmat for kind information, please

Annexure - A/4



भारत सरकार/ GOVERNMENT OF INDIA
लक्षद्वीप प्रशासन/ LAKSHADWEEP ADMINISTRATION
पंचायत निदेशालय/ DIRECTORATE OF PANCHAYATS
कवरत्ति/ KAVARATTI - 682555

F.No.14/21/2022- DOP (SWM)/844

Dated:29.09.2023

WORK ORDER

Sub:- Provide service to collect/Purchase all Recyclable Waste under Solid and Plastic Waste Management Rule, 2016 for a period of one year with provision for extension -Work Order issued.

- Ref: - (1) NIT F.No.14/21/2022-DOP (SWM) Dated, 17.05.2023 of Director, DOP, Kvt.
(2) Letter of Intent F.No.14/21/2022-DOP (SWM) Dated 23.07.2023.
(3) Note sheet approval F.No.14/21/2022-DOP (SWM), dated 12.05.2023
(4) Performance Guarantee Rs.5,45,724/-submitted by Shri. C.Firos, CM Scrap Traders, S-Square Complex, MB-210 old income Tax office shadipur Port Blair -744 106 dated 20.07.2023
(5) Service Level Agreement constituted on August 2023.


With reference cited on the subject mentioned above, the Department of Panchayats issued work order to Shri.C.Firos, CM Scrap Traders, S-Square Complex, MB-210 old income Tax office shadipur Port Blair -744 106 for providing service to collect/purchase of all recyclable waste under solid and plastic waste management Rule, 2016 for a period of one year with provision for Extension.

The total cost of 15,15,900/- lakh/month (Rupees Fifteen Lakh Fifteen Thousand and Nine Hundred) only approved for Provide service to collect/Purchase all Recyclable Waste under Solid and Plastic Waste Management Rule, 2016 as per the order cited 5th above. The payment will be release as per terms & conditions mentioned in tender documents and Service Level Agreement. The tender will be valid from the date of execution of Service Level Agreement with the firm for one year or provision of extension as per bilateral agreements.

Service Provider shall be responsible for provide service to collect/purchase all recyclable waste under solid and plastic waste management rule.2016 as per availability of conveyance as per Provisional Work Schedule provided in Appendix-A in a tender documents and Service Level Agreement. Payment towards cost of recyclable materials shall be released by the Bidder on the basis of recyclable materials received in kgs at recycle Centre. The payment for the recycled materials shall

be paid to the Executive Officer, Village (Dweep) Panchayats in concerned islands on or before 10th of the proceeding month after receiving the recyclable waste from the concerned island through Packing and Transportation bidder. If the service provider fails to do so, a fine of 0.5% of the total amount will be levied on each day as fine on or after 10th of the succeeding month as per Appendix B and terms and conditions mentioned in tender document and Service Level Agreement.

This is issued with the approval of Advisor to the Administrator vide diary No.2523, 13.09.2023.


24.9.2023
(Rakesh Kumar DANICS)
Director of Panchayats

To

Shri. C.firoz, CM Scrap Traders, S-Square Complex, MB-210 old income Tax office shadipur
Port Blair -744 106

Copy to:-

1. The PA to Secretary (Panchayats), Kavaratti for kind information

Expert Committee Report on Liquid Waste Management in Lakshadweep Islands

As per the MoM dated July 05, 2024, Dr. Girish R. Pophali, Chief Scientist CSIR-NEERI & expert member of the high-level committee presented a holistic approach for the combined treatment of blackwater and greywater, consisting of an anaerobic system followed by constructed wetland. The committee accepted and recommended application of Engineered Natural Sewage Treatment System (ENSETS), for UT of Lakshadweep (UTL) and suggested CSIR-NEERI to provide the design details through technical expert members. Accordingly, CSIR-NEERI approved design details of ENSeTS for implementation in UTL is presented hereunder.

Description of Engineered Natural Sewage Treatment System (ENSETS):

ENSETS is a new techno-economically sound solution for decentralised sewage management while achieving substantial savings in capital and recurring costs over conventional domestic sewage treatment systems.

ENSETS is a natural sewage treatment system, which requires minimum operation and maintenance including skilled manpower, chemicals and energy. It provides natural treatment to sewage through anaerobic system and constructed wetlands and produces excellent effluent quality ensuring BOD: <10; COD: <30; TSS: <10; TN: < 10 and TP: <1 mg/L and helps in attaining the treated effluent quality according to the latest prescribed discharge standards (NGT Norms). Treated effluent can be reused for non-potable purpose including gardening, green belt development and toilet flushing etc.

The natural treatment system (ENSETS) consists of pre-treatment i.e. screening and removal of oil & grease in drains followed by an anaerobic systems and horizontal subsurface flow constructed wetlands. The conceptual schematic diagram of ENSeTS is presented in Figure 1.

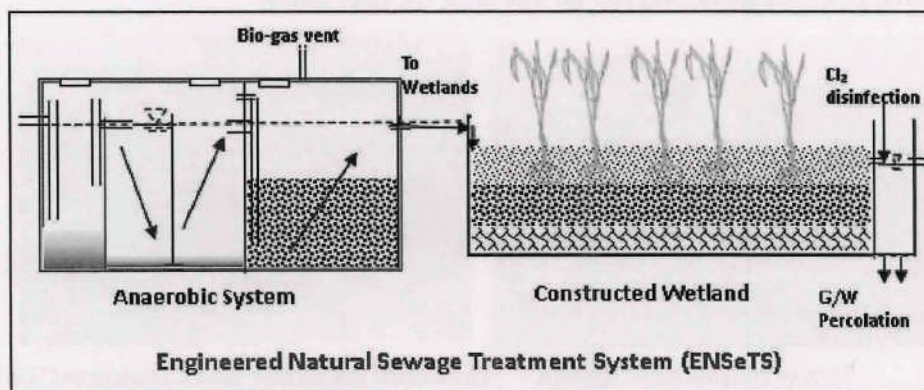


Figure 1: Schematic diagram of Engineered Natural Sewage Treatment System

Anaerobic systems consist of settling cum digestion of solids, anaerobic baffled reactor and then upflow anaerobic filter. Anaerobic filters are placed with some filter media having specific surface area of $150 - 200 \text{ m}^2/\text{m}^3$. Subsurface horizontal flow constructed wetlands are filled with different gradation of river bed or crushed stone filter media and planted with locally available species of *Typha Latifolia* and ornamental plants *Canna Indica*. Anaerobic treatment ensures substantial removal of organic matter present in sewage, whereas constructed wetlands ensure removal of residual organic matter, fine colloidal particles and nutrients. Though, constructed wetlands substantially remove TC & FC, however chlorine disinfection is recommended in order to prevent groundwater contamination.

The concept of ENSeTS has been successfully implemented on full scale at following places:

1) **Ordnance Factory Ambajhary Nagpur for $100 \text{ m}^3/\text{d}$ capacity (2016)**: Anaerobic system, followed by subsurface horizontal flow constructed wetlands

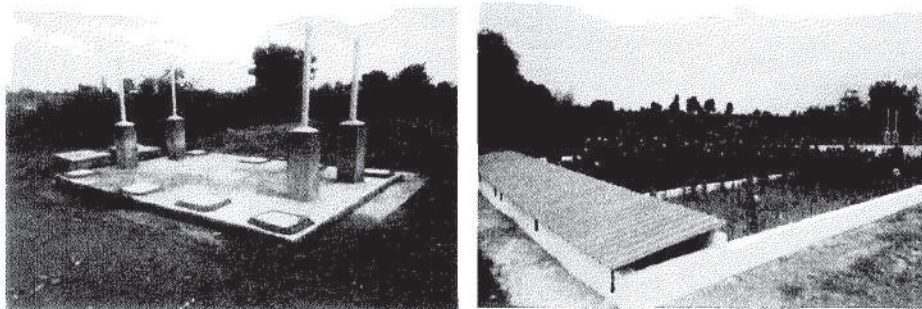


Treated Sewage

Horizontal subsurface
flow Constructed
Wetlands

Anaerobic System

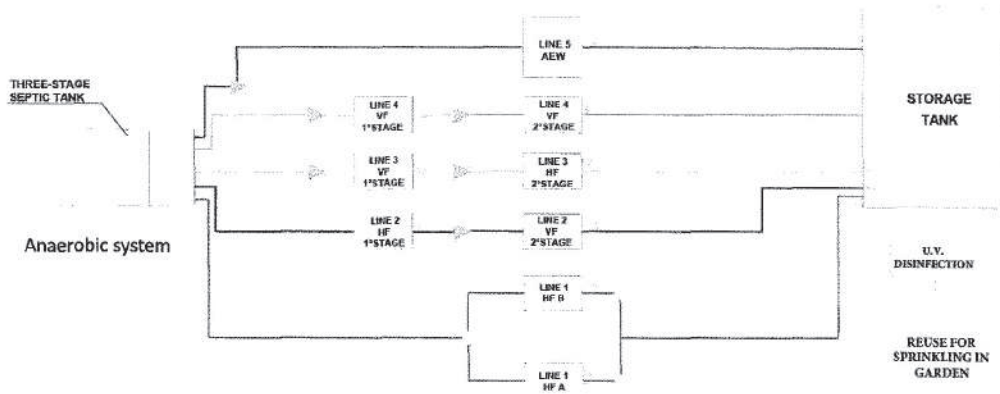
2) **MOIL Ltd. Gumgaon, Nagpur for $150 \text{ m}^3/\text{d}$ capacity (2016)**



Improved Anaerobic System

Horizontal subsurface flow Constructed Wetlands

3) Dayanand Park Nagpur for 100 m³/d capacity (2018): Horizontal anaerobic system, followed by combinations of subsurface horizontal & vertical flow constructed wetlands



Anaerobic system → Various of types of Constructed Wetlands

4) Symbiosis Institute of Technology (SIT), Symbiosis International University (SIU), Pune for 50 m³/d capacity (2022)



Improved Anaerobic System

Horizontal subsurface flow Constructed Wetlands

Advantages of ENSeTS

Both, anaerobic system and constructed wetlands are natural processes and have following advantages:

1. They are less energy intensive and highly efficient in removing organic and nutrient loading respectively.
2. Easy to operate and do not require highly skilled manpower
3. Overall O & M costs are very low since anaerobic systems also produce biogas and no chemicals are required in overall treatment.
4. Suitable for decentralised sewage management applications in housing complexes, urban local bodies (ULBs) and Institutions etc.
5. Highly sustainable and adds to aesthetics as against the conventional sewage treatment plants.

The design details, drawing including plan and section and cost estimates based on the DSR 2023 of ENSeTS are presented in Annexures - I, II & III respectively. As per the suggestions of the high-level expert committee, comments on WASH recommendations are also presented in Annexure - IV.

The report is submitted for perusal of High-level monitoring committee for further necessary action.

Expert Committee Members:


Girish R. Pophal


Anas Abdul Aziz
16/08/24


Robin R. S.
16/08/24


C. N. Shahjahan

Annexure – I

Design Data and Unit Sizes for the Proposed Engineered Natural Sewage Treatment System (ENSeTS) at UTL

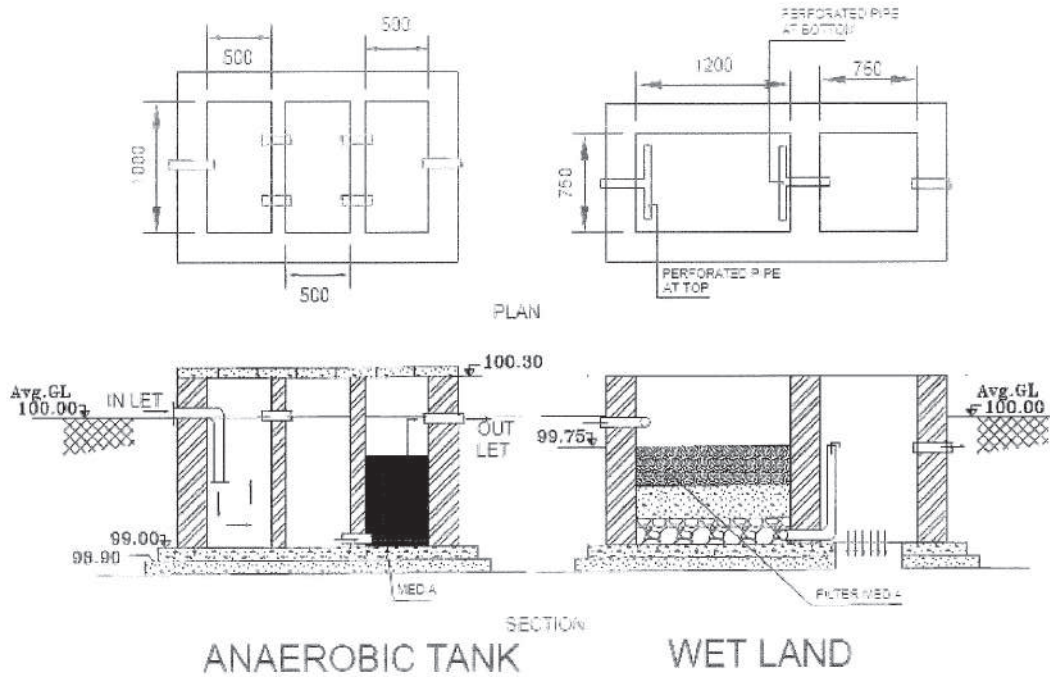
Capacity – 0.35 0.550 m³/d for each household with 6 – 10 persons

Description	Units	Dimensions (L x B x H)
1) Anaerobic System: Overall size 1.5 x 1.0 x 1.0 + 0.3 F.B.		
Drawing No. 01		
(A) Settling cum Digestion Chamber		
Flow	m ³ /d	0.35 – 0.55
Chamber Size	m	0.5 × 1.00 × 1.00
Free board	m	0.30
HRT	d	0.9 – 1.4
No. of units	--	01
Inlet pipe with 90° bend 110 mm dia.	01	PVC material
Outlet top inserts to baffled reactor 110 mm dia.	02	PVC material
Desludging period	Year	1 to 1.5 or as per actual site conditions, whichever is less
Material of construction	--	Brick work with inside plaster and suitable impervious raft foundation
(B) Baffle reactor		
Flow	m ³ /d	0.35 – 0.55
Chamber size	m	0.5 × 1.00 × 1.00
Free board	m	0.30
Detention Time	d	0.9 – 1.4
No. of units	--	01
Outlet bottom inserts to anaerobic filter 110 mm dia.	02	PVC material
Material of construction	--	Brick work with inside plaster and suitable impervious raft foundation
(C) Anaerobic filter		
Flow	m ³ /d	0.35 – 0.55
Chamber size	m	0.5 × 1.00 × 1.00
Free board	m	0.30
No. of units	-	1
Detention time	d	0.9 – 1.4
Volume of filter media @ 40%	m ³	0.2
Specific surface of filter media	m ² /m ³	Min. 150 or vendor specific

Description		Units	Dimensions (L x B x H)
Filter media size & shape		mm	100 – 150, Cylindrical
Type of filter media (material)		-	Non-floating preferable with recycled HDPE / PP
Material of construction		-	Brick work with inside plaster and suitable impervious raft foundation
Piping details as per drawing		-	PVC
Bio gas vent		mm	PVC, 75 – 100 dia. 10 – 12 ft height
2) Subsurface horizontal flow constructed wetlands			
Drawing No. 01			
Flow		m ³ /d	0.35 – 0.55
Hydraulic retention time		d	1.6 – 2.6
No. of units		-	01
Size		m	1.2 x 0.75 x 0.75 + 0.25 FB
Size and depth of filter media (starting from bottom)			
- 25 – 40 mm washed gravel			- 0.20
- 12 - 25 mm washed gravel		m	- 0.25
- 2 - 6 mm washed Fine gravel (Coarse sand)			- 0.30
Type of Filter media		-	Rounded Gravel is preferred over Crushed gravel
Average Media Depth		m	0.75
Free board		m	0.25
Total Depth		m	1.0
Water depth		m	0.70
Type of plants		-	Phragmites australis Or Typha latipholia and Canna indica
Material of construction		-	Brick masonry with suitable impervious raft foundation
Piping details as per drawing		-	PVC material
Collection Tank attached to Wetland			
Drawing No. 01			
Flow		m ³ /day	0.35 – 0.55
Detention time		d	1.0 – 1.60
No. of units		-	01
Size of chamber		m	1.0 x 0.75 x 0.75 + FB
Free board		m	0.25
Material of construction		-	Brick masonry with pervious foundation

Description	Units	Dimensions (L x B x H)
Piping details as per drawing	-	PVC material
Chlorination		
Flow	m ³ /day	Annexure - I continued.....
Liquid Cl ₂ Purity	%	10 - 12
Cl ₂ dose	mg/L	5.0
Cl ₂ dose solution	%	1.0
Water requirement for dosing	ml/d	275.0
Liquid Cl ₂ requirement	ml/d	2.75
Cl ₂ dose application rate	ml/10 minute	0.8

Annexure - II



ALL DIMENSIONS ARE IN MM

Drawing No. 1: Plan, Section and Hydraulics of Anaerobic System and Constructed Wetland

Annexure – III

Civil Estimate for Anaerobic System and Constructed Wetland

Lakshadweep Public Works Department						
Civil Estimate of Anaerobic System and Constructed wetland						
				Division : Kavaratti		
				Sub Division : Kavaratti		
Item No.	Ref	Sub-heads and items of work	Quantity	Unit	Rate	Amount
1	LSR 2018 2.2.1	Earth work in excavation by mechanical means (Hydraulic Excavator) manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and remaining of bottoms, lift upto 1.5 m including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. All kind of soil.	13.00	Cum	445.60	5792.80
2	LSR 2018 2.6	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc layers not exceeding 20cm in depth consolidating each deposited layers by ramming and watering lead up to 50 mtr and lift up to 1.5 metres.	4.00	Cum	252.65	1010.60
3	LSR 2018 3.4	Providing and laying in position cement concrete 1:3:6 (1 cement: 3 M.Sand:6 graded stone aggregate 20mm size) excluding the cost of centering & shuttering all work up to plinth level.	1.10	Cum	13893.45	15282.80
4	LSR 2018 5.1	Brick work with modular bricks of class designation 75 in foundation and plinth in C.M.1:4 (1Cement: 4 Metal sand)	4.25	Cum	18909.24	80364.27
5	LSR 2018 4.1	Reinforced cement concrete work 1:1.5:3 (1 cement 1.5 M sand 3 granite chippis 20mm nominal size excluding cost of centring, shuttering and reinforcement. Foundation footing base of column etc and mass concrete	1.25	Cum	15491.75	19364.69
6	LSR 2018 4.7	Thermochemically treated steel reinforcement of grade FE 500 for R.C.C work including bending, binding and placing in position complete.	90.00	Kg	83.10	7479.00
7	LSR 2018 4.14	Centering and shuttering including strutting propping bressumarse and cantilivers up to floor five level etc and removal of form work for Suspended floors, roofs, landings, shelves and their supports balconies, lintels beams gradars, bressumarse and cantilivers up to floor five level	1.50	Sqm	736.91	1105.37
8	LSR 2018 11.7	12mm cement plaster 1:3 (1cement :3 metal sand) finished with floating coat of neat cement	30.00	Sqm	629.73	18891.90
9	LSR 2018 8.9	Steel work welded in built up section & framed work including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer using structural steel etc. as required. In grating, frames, guard bar, ladder, railings, brackets, gates and similar works.	20.00	Kg	172.97	3459.40
10	DSR 2023 with cost mdax (1.99) 19.21	Making connection of drain or sewer line with existing manhole including breaking into and making good the walls, floors with cement concrete 1:2:4 mix (1 Cement: 2 coarse san: 4 graded stone aggregates 20 mm nominal siz) cement plastered on both sides with cement mortar 1:3 (1 cement : 3 coarse sand), finished with floating coat of neat cement and making necessary channels for the drain etc. complete.				
10	19.21.1	For pipes 100 to 250 mm dia	2.00	Each	1612.80	3225.60
11	LSR 2018	Providing, lowering, laying and placing in position, filter media of required gradation, shapes and sizes with all leads and lifts involved including transportation of materials to site of works, screening as gradation provided in specifications and washing of materials and placing in position with given section, including all applicable taxes etc. complete, as directed by Engineer in charge.				

Annexure – III Continued.....

11.1		25-40 mm washed gravel	0.20	Cum	4750.00	950.00
11.2		12-25 mm washed gravel	0.25	Cum	4750.00	1187.50
11.3		2-6 mm washed gravel coarse sand	0.30	Cum	4750.00	1425.00
12	LSR 2018 14.11	Providing , laying and joining PVC pipes grade 'A' with solvent cement including curing jointing etc complete.				
12.1		(s) 110 mm diameter pipes	6.00	Mtrs.	561.01	3366.06
		TOTAL				162904.99
		Add 5% Contingencies	162904.99		5%	8145.25
		GRAND TOTAL				171050.24
		Say			Rs.	1,71,050/-
Rupees (One Lakh Seventy One Thousand and Fifty) only						

Annexure – III Continued.....

Lakshadweep Public Works Department						
Civil Estimate of Anaerobic System and Constructed wetland in the existing septic tank						
Division : Kavaratti						
Sub Division : Kavaratti						
Item No.	Ref	Sub-heads and items of work	Quantity	Unit	Rate	Amount
1	LSR 2018 19.4	Demolishing brick work, manually/ by mechanical means including stacking of serviceable material and disposal of unserviceable material within 50 metres lead as per direction of Engineer-in-charge. In Cement mortar	0.43	Cum	1712.36	736.31
2	LSR 2018 2.2.1	Earth work in excavation by mechanical means (Hydraulic Excavator)/ manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. All kind of soil.	3.67	Cum	445.60	1635.35
3	LSR 2018 2.6	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc layers not exceeding 20cm in depth consolidating each deposited layers by ramming and watering lead up to 50 mtr and lift up to 1.5 metres.	0.83	Cum	252.65	209.70
4	LSR 2018 3.4	Providing and laying in position cement concrete 1:3:6 (1 cement: 3 M.Sand:6 graded stone aggregate 20mm size) excluding the cost of centering & shuttering all work up to plinth level.	0.38	Cum	13893.45	5279.51
5	LSR 2018 6.4	Cement concrete block (machine moulded) masonry in CM 1:6 with blocks of size 40cmx20cmx10cm	1.58	Cum	13128.00	20742.24
6	LSR 2018 11.7	12mm cement plaster 1:3 (1 cement :3 metal sand) finished with floating coat of neat cement	16.92	Sqm	629.73	10655.03
7	LSR 2018 8.9	Steel work welded in built up section / framed work including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer using structural steel etc. as required. In grating, frames, guard bar, ladder, railings, brackets, gates and similar works.	20.00	Kg	172.97	3459.40
8	DSR 2023 with cost index (1.99) 19.21	Making connection of drain or sewer line with existing manhole including breaking into and making good the walls, floors with cement concrete 1:2:4 mix (1 Cement: 2 coarse san: 4 graded stone aggregates 20 mm nominal size) cement plastered on both sides with cement mortar 1:3 (1 cement : 3 coarse sand), finished with floating coat of neat cement and making necessary channels for the drain etc. complete.				
8.1	19.21.1	For pipes 100 to 250 mm dia	2.00	Each	1612.80	3225.60
9	LSR 2018	Providing, lowering, laying and placing in position, filter media of required gradation, shapes and sizes with all leads and lifts involved including transportation of materials to site of works, screening as gradation provided in specifications and washing of materials and placing in position with given section, including all applicable taxes etc. complete, as directed by Engineer in charge.				
9.1		25-40 mm washed gravel	0.20	Cum	4750.00	950.00
9.2		12-25 mm washed gravel	0.25	Cum	4750.00	1187.50
9.3		2-6 mm washed gravel coarse sand	0.30	Cum	4750.00	1425.00
10	LSR 2018 14.11	Providing , laying and jointing PVC pipes grade 'A' with solvent cement including cutting jointing etc complete.				
10.1		(a) 110 mm diameter pipes.	6.00	Mtrs.	561.01	3366.06

Annexure – III Continued.....

11	LS	Replacing and fixing of RCC slabs with cement mortar 1:4 and other miscellaneous works	1.00	LS	5000.00	5000.00
		TOTAL				57135.39
		Add 5% Contingency:	57135.39	5%		2856.77
		GRAND TOTAL				59992.16
		say			Rs.	60,000/-
Rupees (One Sixty Thousand) only						