

OA 606/2018 - Status cum actions taken report

2 messages

an. Jazhavelil ramakrishna pillai <avrpillai@gmail.com>

Tue, Apr 23, 2019 at 7:37 PM

To: A B Akolkar <abakolkar@gmail.com>

Cc: "DR. AJIT HARIDAS" <chn.kspcb@gmail.com>, KSPCB HO <rulespcb@gmail.com>, filing.ngt@gmail.com, Consultant Judicial NGT <ngt.filing@gmail.com>

 **SLMC-REPORT-OA 606 of 2018 (April 2019).pdf**

Please find attached scanned copy of the status cum action report in OA 606/2018.

Regards

Justice AV Ramakrishna Pillai

2 attachments **LETTER TO NGT.pdf**
209K **INDEX.pdf**
228K

Cunsultant Judicial NGT <ngt.filing@gmail.com>

Thu, Apr 25, 2019 at 10:07 AM

To: abakolkar@gmail.com, ranupurohit.ngt@gmail.com, spritam.ngt@yahoo.com, Manoj Kumar <advocatemanojbajaj@gmail.com>

O.A. NO. 606/2018 FOR STATE OF KERALA

*Regards**Consultant Judicial*

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JUSTICE A.V. RAMAKRISHNA PILLAI
(Former Judge, High Court Of Kerala)
CHAIRMAN

State Level Monitoring Committee, Kerala

(An authority constituted by the
National Green Tribunal)
'AMPAZHAVELIL'
Rajeev Nagar, Elamakkara
Kochi-682026

Home Office: 0484-2408388
Mob: 9447090130
8139878758
e-mail: avrpillai@gmail.com

22/04/2019

Dear Registrar,

Kindly see the appended report on the status cum action taken by the various Government Departments in the State for the implementation of the Environmental laws, prepared on the basis of order dated 16.1.2019 in O.A.No.606/2018 pending before the Hon'ble National Green Tribunal, Principal Bench, New Delhi.

The same may be submitted before the Bench for consideration and further orders.

Yours Sincerely,

Justice A.V.Ramakrishna Pillai.

To
The Registrar,
National Green Tribunal,
Principal Bench, Faridkot House,
Copernicus Marg, New Delhi-110001.

Enclosure:- As above.

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24/4/19
1147/DR/J/Deu
25/4/2019

Ld RG
DR (J)
27.04.19

26.4.19
Copy to Dr. Akolkar

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e-mail: avrpillai@gmail.com

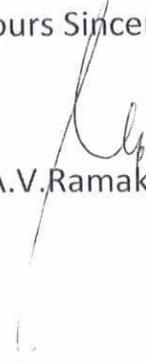
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**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL,
PRINCIPAL BENCH, NEW DELHI.**

O.A. NO.606/2018

**REPORT ON STATUS CUM ACTION TAKEN BY THE DIFFERENT
GOVERNMENT DEPARTMENTS FOR IMPLEMENTING THE
VARIOUS ENVIRONMENTAL LAWS**

PRESENTED BY

JUSTICE A.V.RAMAKRISHNA PILLAI

(FORMER JUDGE, HIGH COURT OF KERALA)

CHAIRMAN STATE LEVEL MONITORING COMMITTEE, KERALA

(FOR AND ON BEHALF OF THE AFORESAID COMMITTEE)

COMPLIANCE: ORDER DATED 16.01.2019

by SLMC,
Kerala

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INTRODUCTION

The State Level Monitoring Committee, Kerala, (SLMC for short) was constituted by this Hon'ble Tribunal as per orders dated 16.1.2019 in O.A.No.606/2018 with Justice A.V.Ramakrishna Pillai, Former Judge of High Court of Kerala as the Chairman, for a holistic integrated and co-ordinated effort to implement the various provisions of the environmental legislations. The Member Secretary of Kerala State Pollution Control Board (KSPCB for short) is the member Secretary of SLMC. The Secretaries of Local Self Government Department (LSGD), Health and Family Welfare Department and Department of Environment are the members.

The first meeting of the SLMC was held on 14.2.2019 at Thiruvananthapuram. The Chairman SLMC, inviting the attention of the members and other participants to the different orders of this Hon'ble Tribunal stressed the need for the proper implementation of the various environmental legislations in a time bound manner. It was also suggested that successful models who had properly implemented the environmental legislations be chosen to find out whether the same could be replicated in other places. The necessity of finalising a strategy for monitoring the provisions of each rules in separate meetings was also suggested. The Secretaries concerned were requested to make their suggestions sufficiently early which would make the process easy. In the discussions followed, the details of the progress hitherto achieved in the implementation of the provisions of various environmental laws as well as the suggestions for improvement were also placed. After the discussions the following decisions were taken in the first meeting.

- a) Meetings of SLMC are to be conducted twice in a month preferably on the second and fourth week of every month. To ensure continuity of action, the presence of Head of Departments who are the Members of the committee has to be ensured in all the meetings. However their presence can be dispensed with under compelling circumstances. In such cases a competent officer who is able to answer the queries has to be deputed.
- b) A nodal officer not below the rank of Deputy Secretary has to be designated by each department for the effective co-ordination between SLMC and different departments. The KSPCB has to collect information through the nodal officers to be placed before SLMC. Similarly decisions of the SLMC

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- has to be transmitted through the nodal officers to different bodies. The presence of the nodal officers shall be ensured in all meetings.
- c) An official website has to be launched exclusively for the SLMC. The proceedings of each meeting shall be published after the minutes are signed by the Chairman to ensure transparency.
 - d) The date, time and venue along with agenda items of each meeting are to be brought to the notice of all the Members of SLMC and others concerned by the SPCB sufficiently early. Change of date, time, venue etc., if any, also shall be intimated sufficiently early.
 - e) The draft minutes of each meeting prepared by SPCB has to be forwarded to the Chairman for correction if any and for approval. After obtaining the signature of the Chairman, it shall be loaded in the official website of the SLMC. The minutes so prepared, signed and published shall be passed in the next meeting.
 - f) Strategies evolved and its implementations as well as the hurdles experienced during its implementation; strategies evolved but yet to be implemented and the strategies yet to be evolved are to be submitted to the SLMC by the different departments. The Secretaries concerned shall make their suggestions sufficiently early.
 - g) Action plan specifying the time line for implementation has to be submitted by the Government. Suggestions can be made by all members which are to be collected and forwarded to the Chairman within two weeks thereafter so that the same can be finalised in the next meeting.

Thereafter, another special meeting of the SLMC was held at Ernakulam on 22.2.2019 in the light of a major fire that broke out at about 4 p.m. on 22.2.2019 at the yard of Brahmapuram solid waste treatment plant which is situated at the outskirts of Kochi city within the limits of Kochi Municipal Corporation. The people's representatives of Ernakulam, Kunnathunadu and Thrikkakkara Constituencies as well as the Mayor of the Kochi Corporation and the District Collector were advised to attend the meeting. The MLAs of Ernakulam and Kunnathunadu constituencies did not respond to the notice. The District Collector could not attend the meeting because of official exigencies. The Additional Chief Secretary, LSGD, Additional Chief Secretary, Health and Family Welfare Department and Principal Secretary,

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Department of Environment also could not attend the meeting due to official exigencies. Smt.Soumini Jain, the present Mayor of the Kochi Corporation shared the following informations:

1. A stay order has been obtained from the High Court of Kerala against remittance of fine by the Corporation. The Corporation has taken several steps to successfully deal with the solid wastes collected day by day.
2. A proposal for establishing a plant for converting the entire waste to energy has been submitted by the Kochi Corporation to the Government for which all the clearances except environment clearance has been obtained.
3. The Corporation is at present collecting waste from five Municipalities namely Maradu, Thrikkakkara, Kalamassery, Aluva and Eloor and two Panchayats also which do not have sufficient land for solid waste disposal.
4. At present the corporation is operating 100KLD leachate treatment plant as a temporary measure. Three phase electricity connection for this plant is applied for, so as to ensure continuous operation. Full fledged plant was proposed as a long term measure.
5. Arrangements have been made for segregating the waste before collection. Door to door collection is also arranged.
6. Plastics of thickness below 50 micron is banned. Gauge meter for measuring the thickness is being provided to corporation staff. In order to stop the sale of plastic carry bag less than 50 micron size a meeting is proposed with wholesalers of carry bags.
7. Security and patrolling facility is provided at the Brahmapuram site.
8. Lighting facility is also provided at the Brahmapuram site.
9. Arrangements for wetting the dumped wastes materials are provided.
10. Drains around the dump site have been cleared. Maintenance was also done to make the collection of leachate easy.
11. A 1500 m long road has been constructed through the periphery of the dump site.
12. Awareness programme to public not to deposit waste particularly biodegradable waste in tied plastic bags on the road side is proposed.
13. Sheet pilling has been done to prevent sweepage along the length of Kadambra river.

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14. In order to fill the gap between production cost and income generated from the proposed **waste to energy plant**, they have made agreements with BPCL to spend their CSR fund and Suchitwa Mission into the project.

The Secretary of the Kochi Municipal Corporation corroborating the statements of the Mayor added as follows:

1. Only the segregated waste are brought to the site.
2. Door to door collection is provided to great extent.
3. Only the road sweepings and waste dumped on the road side are the mixed waste brought to the site.
4. Material recovery centres are provided.
5. Covered vehicles are provided for waste transportation.
6. Full time surveillance is provided at the site.
7. A 10m wide road is being constructed.
8. Two numbers of motors are provided for continues wetting of the heaped waste, in order to avoid further instances of fire.
9. Generally the quantity of waste collected per day is 350 tonnes (250 tonnes of biological waste and 100 tonnes plastic waste) approximately.
10. Market waste is properly segregated and brought to the site.

The Environmental Engineer, Kochi Corporation submitted that the following measures were proposed by the Corporation:

Short Term Measures

1. All the sieves (Tromwells) of the biological waste processing plant have been repaired.
2. Twenty three windows are prepared in the composting shed.
3. New drains have been constructed and leachate is being transferred to treatment plant. Construction is reported to be difficult as the soil is clayey.

Mid term measures

Expression of interest has been called for capping the legacy waste. Three agencies have applied which are to be opened on 7th March 2019.

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Long term measures

1. Capping works to be completed.
2. Scientific sanitary land fill to be set up.
3. Permanent set up to be provided for leachate treatment for which detailed project report (DPR) is being prepared.
4. Waste to energy plant to be set up in 18 months.

Sri.P.C.Thomas, MLA, Thrikkakkara pointed out the following matters:

1. The wastes from 5 municipalities and 2 panchayats in addition to the Kochi Corporation are being brought to the Brahmapuram site. The dumping of untreated waste and the open transportation of the waste is causing severe public nuisance particularly to the people of Thrikkakara Constituency.
2. The other local bodies are not concerned with the disposal of their wastes, since it is being brought to the Bhrahmapuram site. Hence responsibilities of each local body have to be fixed.
3. Even though there is specific agreement regarding the transportation of the wastes the conditions therein are to not complied with. Open transportation and spilling of the waste into the roads is common practice. Several vehicles are under repair. Instead of enclosed vehicles open vehicles are used violating the conditions in the agreement.
4. Common responsibilities are to be decided and assigned to corporation officers also regarding the waste transportation disposal etc. At present vehicle log book is not maintained. Cameras are not functioning. Even a plant set up spending 12 Crore Rupees for wastes processing is not functioning.
5. Door to door collection has to be made more effective. Resident's association and Kudumbasree participation has to be ensured.
6. The wastes collecting employees are not sufficiently protected from health hazards. They shall be given adequate protective equipments health services.
7. The present wastes dumping yards are to be made proper.
8. The health wing of corporation need to function more effectively.

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9. Sewage, septage and chicken wastes are being disposed to all the water sources in the district. Kadambra river is severely polluted particularly in the rainy season.
10. The apartments are not operating their sewage treatment plant on account of increased electricity consumption. They are disposed of through septage collecting lorries. These vehicles are disposing the septage in the nearest available water sources.
11. Even the segregated plastics are not disposed of effectively but simply burned.
12. The waste to energy plant proposed by corporation is understood to be approved and signed by the Government. Its viability should be looked into.

As the Secretaries of LSGD, Health and Family Welfare Department as well as the Environment Department could not attend the said meeting, the Secretary of Cochin Corporation was directed to submit the reports on action taken before the next meeting of the SLMC.

The 2nd meeting of the SLMC was held at Thiruvananthapuram on 15.2.2019. In the said meeting matters relating to polluted stretches of Karamana and Killiyar river were discussed and the following decisions are taken.

1. Action plan has to be submitted for the Rejuvenation of all rivers mentioned in the O.A.Nos.581/2018, O.A.No.582/2018 and 673/2018 now pending before the NGT, by the Water Resources Department before the next meeting. (Action: Water Resources Department)
2. The Water Resources Department have to depute a nodal officer not below the rank of a Deputy Secretary to the River Rejuvenation Committee (Action: Water Resources Department)
3. The nodal officer of the Water Resources Department and nodal officer of the Kerala State Pollution Control Board, shall share the decisions of the meetings and the same shall be placed before the committees concerned. (Action: Nodal Officer, SLMC-Kerala, KSPCB and Nodal Officer, Water Resources Department)

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The issue of Brahmapuram Solid waste yard was taken up for consideration in that meeting also. Surprisingly another fire broke out in the waste dumping yard at Brahmapuram on that day ie.,on 15.2.2019 also. The SLMC expressed the displeasure over the action taken by the Corporation of Kochi in disposing the legacy waste. The following resolutions were taken in the matter.

1. The legacy waste shall be disposed of part by part, by means of bio-mining as per the guidelines of SPCB within 15 days involving a technical expert and to take necessary arrangement for addressing the present environmental issues till the Waste to Energy plant comes into existence. If capping of waste is resorted to it should be confined to 'inert waste' as per the provisions of the SWM Rules, 2016. (Action: Kochi Corporation)
2. KSPCB shall provide technical field supervision and support to the Kochi Corporation in this regard. (Action: KSPCB)
3. Kochi Corporation shall keep ESCROW amount for handling emergency situation. (Action: Kochi Corporation)
4. The waste transporting vehicles of Kochi Corporation are to be provided with adequate cover, leachate collection tank and log book. Only those vehicles having all specifications for waste transportation shall be allowed by the Health Supervisor. The permit of the vehicles violating the norms shall be cancelled. The details of vehicles already purchased by the Corporation under different schemes shall be submitted to SLMC before the next meeting. (Action: Health Supervisor, Kochi Corporation)
5. Ex-Service armed security shall be engaged at the segregation points in the dump yard as done in Adimali – Idukki Road (Action: Kochi Corporation)
6. The Secretary Kochi Corporation shall inspect the NH Bypass, 'Sahodaran Ayyappan' Road & Banerjee Road to make the roads, 'Zero waste Road' within 15 days. Camaras shall be installed on those roads for proper monitoring. (Action: Kochi Corporation)
7. Door to door collection of waste shall be insisted upon.

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8. Plastics carry bags of thickness below the prescribed limit shall be banned in the city. The violators shall be proceeded against under law for penalisation.
9. As it was brought to the notice of the Committee that waste collecting employees are not sufficiently protected from health hazards, they shall be given adequate protective equipments namely, gumboots, gloves, masks etc., and those workers shall be compelled to wear the same while on duty.
10. Disposal of sewage, septage and chicken waste in the water resources in the district has to be brought to an end by proceeding against the violators under law.
11. Apartments, hotels, hospitals which are not operating their sewage treatment plants on lame excuses are to be proceeded against under law to ensure complaints.
12. As it is brought to the notice of the Committee that even segregated plastics are not disposed of properly, methods are to be evolved for effective disposal of plastics. Plastics shall not be disposed of by burning under any eventuality.

The third meeting of the SLMC was held at Thiruvananthapuram on 6.4.2019. In the said meeting the matters relating to polluted stretches of Karamana and Killiyar rivers were considered. Further decisions were taken and directions were given to the authorities concerned. It was resolved that a report cum action plan prepared by the Chairman SLMC after discussions with Chairman, KSPCB be presented before this Hon'ble Tribunal before the time limit prescribed.

In the matter of Solid Waste Yard, Bhramapuram the following further directions are given.

1. Kochi Corporation shall dispose the legacy waste part by part by means of bio mining as per the guidelines of SPCB, involving a technical expert and shall take necessary arrangement for addressing the present environmental issues till the Waste to Energy plant comes into existence. It was further directed that compliance report be filed before the next meeting of SLMC. (Action: Kochi Corporation)

2. Directions issued to the Kochi Corporation vide the minutes of the 2nd meeting of SLMC dated 15.3.2019 shall be forwarded to the District Collector, Ernakulam to oversee the implementation of these directions. (Action: KSPCB)
3. All the directions as per the discussion of the SLMC shall be complied with and a report be submitted in writing to the SLMC within 2 weeks (Action: Kochi Corporation)
4. Agenda regarding allocation of land for setting up of CBMWTF at Brahmapuram shall be placed for reconsideration of Corporation Committee. If the committee rejects the agenda, the same shall be submitted to the Government. (Action: Kochi Corporation)
5. In addition to the officials present in the meeting, the Deputy Mayor and Health Standing Committee Chairman shall be invited to the next SLMC meeting (Action: Kochi Corporation)

In the same meeting the status cum action taken reports submitted by the various government departments regarding solid waste management were considered and resolved that a consolidated status cum action taken report be prepared with the assistance of the Chairman of the KSPCB which has to be presented by the Chairman SLMC before this Hon'ble Tribunal.

The further decision was to have District Level Monitoring Committees in all districts with the District Magistrate (District Collector) as the Chairman for the effective implementation of various environmental laws.

In addition to this two field visits were conducted. The first one was by the Chairman along with officials of the Regional Office of KSPCB at Ernakulam, on 17.02.2019 near Pathalam Bridge across the river Periyar. This was in the light of a report in the National Daily 'Hindu', regarding colour change notice at the stagnater water near the aforesaid bridge.

The other field visit was on 5.4.2019 by the SLMC along with the officials of KSPCB, Kerala Water Authority, State Irrigation Department and Thiruvananthapuram Municipal Corporation along the banks of Karamana and Killiyar rivers.



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An awareness programme on environmental legislations was conducted at Idukki with the assistance of KSPCB. It was on 3.4.2019. The participants were the Secretaries of the various local bodies in the District.

II

STATUS DATA COLLECTED BY THE SLMC

The SLMC is given to understand that the LSGD has formed Swichith Mission to provide technical support to Local Governments in the field of sanitation and waste management sector. The Minister for Local Self Government as it's Chairman. The Administration of the Mission is by an Executive Committee headed by the Principal Secretary of LSGD.

The SLMC was informed by the Additional Chief Secretary of LSGD, that de-centralised treatment of waste is implemented in the State. Composting of biodegradable waste at institutional level, and house hold level is in practice. For non-degradable wastes materiel collection facility, and resources recovery where collected plastics are shredded which can be used for road tarring is practiced. It was also stated that waste to energy plants are envisaged at Thrissur, Kollam, Palakkad and Kannur which are at various stages viz., tendering, allotment of land etc. Small plants are under implementation at Sulathan Bathery, Chinnakanal and Munaar. Suchithmission is giving technical support to local government institutions. The committee was also informed that the steps for giving awareness programmes through Haritha Kerala Mission were also taken.

In the 2nd meeting of the SLMC, held on 15.3.2019 the LSGD has submitted a strategy on actions taken and to be taken by the said department in the matter of solid waste management. This was as per the directions given in the start up meeting. The same is marked as Ext.X1. As the insufficiency of Ext.X1 was pointed out they have produced the details of Municipal solid waste generated per day and other details in the 3rd meeting. It is marked as X1(a), X1(b) which is produced in the same meeting contains the details of segregation of solid waste in various local bodies.

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X1(c) which is the Panchayathwise details of solid waste generation and related matters was also produced.

After repeated directions the Principal Secretary of Health and Family Welfare Department submitted a hard copy of the action taken report on the implementation of Environmental Protection legislation. He had made a power point presentation also. The photocopy of the aforesaid hard copy is annexed as Ext.X2. Sharing of the soft copy of X2 through e-mail to the Chairman SLMC (it would have been easier for attaching the same to this report) was out rightly denied by the Principal Secretary of the Health & Family Welfare Department, such an attitude is not conducive to the smooth functioning of the SLMC.

The SLMC is given to understand that the e-waste collected in the state is being sent to other States for dismantling/recycling as there is no recycler/dismantler of e-waste in Kerala. Glass wastes are collected and transferred to Pondicherry. Domestic hazards wastes are transmitted to KEIL at Ambalamedu.

The KSPCB has reportedly taken the following legal actions in the matter.

- a. Legal notices to all Secretaries of census towns for failure to implement SWM Rules 2016 as per timeline in Clause 22(5), 22(6), 22(7).
- b. Notice to all District Collectors of corresponding districts for failure to allocate land for solid waste management facilities as per timelines in Clause 22(1) and 22(3)
- c. Letter calling attention of Additional Chief Secretary, Local Self Government Department, to SWM 2016 Rule.
 - i. 11(e) (master plan preparation),
 - ii. 11(f) (land allocation)
 - iii. 11(j) (common regional sanitary landfill.)

A consolidated action taken report prepared with the assistance of the Chairman KSPCB is appended as Ext.X3 to this report. Ext.X3(a) contains

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the details of fine collected by KSPCB from erring institutions on the basis of 'Polluter Pays' principle.

III

CONCLUSION

To make the implementation of the various environmental laws more effective, a decision was taken in the SLMC meeting held on 6th April, 2019 as pointed out in the introductory part to form district level monitoring committees under the Chairmanship of the District Magistrate (District Collector) with the following members.

1. District Police Chief.
2. District Medical Officer
3. Deputy Director of Panchayath in the district.
4. A senior officer of the KSPCB from its District Office.
5. A representatives of the District Legal Service Authority preferably its Secretary duly nominated by the Chairman, DLSA (District Judge) with the approval sought by the SLMC from the Hon. Chairman, Kerala State Legal Service Authority.
6. Senior officer of the Forest Department in Districts where there are forest area.
7. A representative of the Kerala Suchitwa Mission in the District.
8. A representative of Haritha Kerala Mission in the District.
9. A senior official of the Collectorate to act as the Nodal officer cum Secretary of the District Level Committee.

The formation of such a committee was felt necessary by the SLMC as more co-ordination was required among the various Departments for the implementation of various environmental laws. It was also decided in the aforesaid meeting of the SLMC that proper sensitisation regarding the environmental laws and the various orders of this Hon'ble Tribunal has to be done. Therefore, the Chairman SLMC has proposed visits to all Districts with previous notice to the District Level Committees after the General Elections 2019 in the State are over.

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OBSERVATIONS:

A. Solid Waste Management Rules 2016

In spite of the various programmes and actions taken by the government in the matters under reference, the achievements are minimal. The success of the project will depend upon continuous monitoring and review in a time bound manner.

It is relevant to note that the policy now followed by the State exonerates the urban local bodies from the responsibility of door to door solid waste collection. In the alternative, responsibility for treatment of solid waste is put on individual house holds. This is inconsistent with clauses 4(a) and 15(b) which ultimately has resulted in a garbage littering everywhere.

Household treatment schemes which were more suited to a bygone era when consumption was limited to what was locally produced than in a modern organised economy, are seen promoted even now without adequate analysis.

As it is neither practical nor economical for most urban households to carry out treatment of wastes, door to door collection is the mandated responsibility or urban local bodies (Kindly see Clause 15(b), SWM Rules, 2016)

It is brought to the notice of SLMC that capping of solid waste is practised in some waste yards maintained by some urban local bodies. Eg. Brahmapuram at Kochi and Vilappilsala at Thiruvananthapuram. Here it is apt to point out that law permits the capping of 'inert waste' only.

Short comings:

1. City masterplans have not identified adequate land for setting up solid waste treatment plant, as per distancing and sitting criteria set in SWM Rules 2016, Schedule I(A)ix.

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2. Government-owned lands have been identified for Solid Waste Management Treatment facilities. While it serves to circumvent problems related to land acquisition, the primary purpose of trouble free waste management (sought to be achieved by sitting criteria in SWM 2016 Schedule I(A)ix) gets sidelined.

Problems peculiar to the State of Kerala

1. Due to the paucity of a land in the State most of the urban areas are thickly populated. "Not in My Back Yard (NIMBY) syndrome" and litigations are common in Kerala. People of the locality have legitimate fear of adverse pollution impact. It must be countered through public awareness programmes about modern pollution control technology and through political consensus building.
2. The Land Acquisition Act 2013 provides attractive compensation for lands acquired. The value of adjacent properties increase for infrastructure projects like roads, but decrease in the case of solid waste management projects due to the significant reason of NIMBY syndrome.

At least in the case of the first projects, monetary compensation can be designed for those may incur loss of real estate value from proximity to solid waste treatment plants. (Suggestion by KSPCB)

Additional Suggestions:

1. It is seen that waste-to-Energy projects are planned in 7 census towns. Technical experts say that it is not economically viable as there would be a wide gap between the cost of production of energy from waste and the cost that could be realised from the consumers of energy so generated. It is reported in one of the meetings of the SLMC that the said viability gap would be bridged by funds shared by the local bodies concerned and the Kerala Suchithaw Mission and some other bodies. Unless there is free flow of funds as suggested which is quite unlikely, the project may come to a grinding halt.

It is true that incineration plans are most commonly used in foreign countries. The first stage of waste-to-energy plant is biological mechanical

treatment (BMT), burning waste into fuel briquettes (RDF). No doubt, the first stage is viable. If it is converted to energy by burning, the cost will be on the higher side and it may not be possible to sell the energy at a rate higher than the one prescribed by Power Regulatory Authority. This may ultimately result in the failure of the project. Therefore, it is feasible to transfer the fuel thus formed to cement factories where it will be burnt at a very high temperature which will reduce pollution generation in the form of air or ash. The BMT Plant will be designed against fire hazards as a completely enclosed shed. Therefore order control arrangement can be ensured. Therefore, it is suggested that before establishing waste to energy plants a techno economical feasibility study be carried out to find out the most effective solution.

2. Malabar Cements Ltd. (A Government of Kerala undertaking), must implement co-processing. Co-processing is a 'best available technology' for solid wastes, as there are no toxic gas emissions or hazardous residues. Modern cement kiln burners are capable of firing upto 50% 'Refuse Derived Fuel'. RDF can be produced in all census town by establishing 'Mechanical-Biological-Treatment – BMT or BMT' plants. The technology is well-proven in India and abroad. The total RDF that can be produced from all census towns in Kerala is less than 400 tpd. It can be fully utilized at Malabar Cements Ltd. (Suggestion: KSPCB)

Further suggestions by Kerala State Pollution Control Board.

Modern Solid Waste Treatment facility require complex engineering. Urban Local Bodies do not have the capacity to implement the projects. Hence, the State requires a technical organisation, viz, Kerala Solid Waste Management Authority to plan, execute and operate Solid Waste Treatment facilities. The responsibility of Urban Local Bodies should be limited to collection and transport to plants established and operated by the Authority. The authority will generate its own funds through 'gate fees'.

B. Biomedical Waste Management Rules.

As per the Bio-medical Waste Management Rules 2016, institutions generating biomedical waste include hospitals, nursing homes, clinics,

dispensaries, veterinary institutions, animal houses, pathological laboratories, blood banks, etc. These institutions are required to provide facilities for the safe treatment and disposal of bio-medical waste.

The State has a large number of health care institutions (HCI). These include hospitals, primary health centres, clinical laboratories, blood banks nursing homes, pathological laboratories and dispensaries. Apart from this, there are a large number of veterinary institutions and animal houses generating biomedical waste. More over the Universities and the research institutions attached to various organisations are also generating biomedical waste.

In order to implement and enforce Bio medical Waste Management Rules, 2016 effectively, authentic and accurate data of bio-medical waste generated in the State is necessary.

Waste generation from Health Care Institutions (HCIs) are generally classified as bio-medical waste, general waste and liquid waste which included sewage and sullage.

The liquid waste generation is mainly by toilets, bathrooms, laundries, canteen, floor washing, nursing station, operation theatres, labour room, out-patients, consulting rooms, laboratories, blood bank, pharmacy etc., General waste include waste from offices and food waste from canteen, patients and bystanders.

Any waste generated during diagnosis, treatment or immunisation of human beings or animals or in research activities pertaining thereto or in the production or testing of biological or in health camps can be termed as biomedical waste. Any preparation made from organisms or microorganisms or product of metabolism and biochemical reactions intended for use in the diagnosis, immunisation or the treatment of human beings or animals or in research activities pertaining thereto are termed as biological.

Bio medical Wastes are classified into 4 types.

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Types of bio-medical waste

Category	Type	Description
Yellow	(a) Human Anatomical Waste:	Human tissues, organs, body parts and fetus
	(b) Animal Anatomical Waste	:Experimental animal carcasses, body parts, organs, tissues
	(c) Solid Waste:	Items contaminated with blood, body fluids like dressing, plaster casts, cotton swabs and bags containing residual or discarded blood and blood components.
	(d) Expired or Discarded Medicines:	Pharmaceutical waste like antibiotics
	(e) Chemical Waste:	Chemicals used in production of biological and used or discarded disinfectants
	(f) Discarded linen, mattresses, bedding contaminated with blood or body fluid.	
	(g) Microbiology, Biotechnology and other clinical laboratory waste	Blood bags, Laboratory cultures, stocks or specimens of microorganisms, live or attenuated vaccines, human and animal cell cultures used in research, industrial laboratories, production of biological, residual toxins, dishes and devices used for cultures.
Red	Contaminated Waste (Recyclable)	Tubing, bottles, intravenous tubes and sets, catheters, urine bags, syringes (without needles and fixed needle syringes)
White	Waste sharps including Metals	Needles, syringes with fixed needles, needles from needle tip cutter or burner, scalpels, blades, or any other contaminated sharp object that may cause puncture and cuts. This includes both used, discarded and contaminated metal sharps.
Blue	Glassware	Broken or discarded and contaminated glass including medicine vials and ampoules except those contaminated with cytotoxic wastes
	Metallic Body Implants	

Hospital waste, due to its infection potential, can be catastrophic and hence requires special attention during its collection, storage, treatment and disposal. Non-destruction or no-disinfection of the wastes gives rise to the dangerous practice of recovery and reuse of discarded syringes/needles, tubes, containers and medicines. Realising the gravity of the issues, the Government of India remodified the Bio-medical Waste Management Rules 2016 (BMW Rules) under the Environment (Protection) Act, 1986. These rules apply to all person who

generate, collect, receive, store, transport, treat, dispose or handle bio-medical waste in any form including hospitals, nursing homes, clinics, dispensaries, veterinary institutions, animal houses, pathological laboratories, blood banks, ayush hospitals, clinical establishments, research or educational institutions, health camps, medical or surgical camps, vaccination camps, blood donation camps, first aid rooms of schools, forensic laboratories and research labs.

As per the BMW Rules, the institutions generating bio-medical wastes are required to obtain authorization from the Prescribed Authority (State Pollution Control Board) and is required to provide facilities for the management of the bio-medical wastes without causing adverse effect on human health and environment. The functions of the Board include issue of authorisations to institutions, reception and processing of annual reports from the institutions and ensuring compliance by the HCI with the Rules and with the conditions of the authorisation issued by the Board.

Management of bio-medical wastes includes collection, segregation, reception, storage, transportation, treatment as well as disposal. Segregation at the point of generation is perhaps one of the most important steps. Types of containers and colour coding for collection of different categories of waste are specified in the Rules. Transportation shall be only after proper packing and labelling and only in the vehicles authorised for the purpose. No untreated waste is to be kept stored for more than 48 hours. Standards for treatment and disposal of bio-medical waste are also specified in the Rules.

Bio-medical waste shall be segregated into containers/bags at the point of generation and treated in accordance with the BMW Rules.

Segregation and treatment of bio-medical waste

Waste category	Colour of container	Types of container	Treatment options
Human and animal wastes, soiled wastes	Yellow	Yellow coloured non-chlorinated plastic bags	Incineration or Plasma Pyrolysis or deep burial
Expired or discarded medicines, chemical waste	Yellow	Yellow coloured non-chlorinated plastic bags or containers	Incineration/sent back to manufacturer
Discarded linen, mattresses, beddings contaminated with blood or body fluid	Yellow	Non-chlorinated yellow plastics bags or suitable packing material	Chemical disinfection followed by incineration or Plasma Pyrolysis/shredding or mutilation or combination of sterilization

			and shredding
Microbiology, Biotechnology and other clinical laboratory waste	Yellow	Autoclave safe plastic bags or containers	Pre-treat to sterilize with nonchlorinated chemicals
Contaminated Waste (Recyclable)	Red	Red coloured non-chlorinated plastic bags or containers	Autoclaving or micro waving/hydroclaving followed by shredding or mutilation or combination of sterilization and shredding
Waste sharps including Metals	White	Puncture proof, Leak proof, tamper proof containers	Autoclaving or Dry Heat Sterilization followed by shredding or mutilation or encapsulation in metal container of cement concrete.
Glassware	Blue	Cardboard boxes with blue coloured marking	Disinfection/autoclaving or microwaving or hydroclaving and then sent for recycling

The SLMC feels that the General Hospital, Ernakulam, Taluk Head Quarters Hospital, Punalur, Community Health Centre, Keecherry, Family Health Centre, Kadirur and Primary Health Centre, Thrikkakara can be sited as roll models which manage bio-medical waste properly. The persons behind the waste management activities in the aforesaid institutions require special appreciation and encouragement. The practices followed in these institutions can be replicated in other health institutions.

In Kerala at present only one common Bio-medical waste treatment facility is functioning which is at Palakkad. It is owned by Indian Medical Association and it is called IMAGE (Indian Medical Association Goes Eco friendly).

The facilities for treatment and disposal of bio-medical waste provided at the common facility include the following:

Incinerators, autoclaves, shredder, ash pit for safe storage of incinerator ash, sharp pit for storage of disinfected sharps and effluent treatment plant to handle the effluent generated in scrubbing, floor wash and vehicle wash.

Bio-medical wastes collected from various hospitals in the State are now being transported to the aforesaid unit at Palakkad. In the meeting of

the SLMC on 6.4.2019 the Additional Chief Secretary to LSGD suggested that at least three more common bio-medical treatment facilities shall be established for the proper treatment of bio-medical waste. However, KSPCB recommends common bio-medical waste treatment plants within 75 km of health care facilities. It was also suggested such units can be sited in Industrial areas and in large campus medical institutions with rapid access from main roads. It is also recommended by KSPCB that Hospitals are to be equipped with medicated autoclaves as specified (Schedule II(3)) for sterilization of infectious waste before it is transported to common bio medical treatment plant.

C. Plastic Waste Management Rules(Observations by KSPCB)

1. Plastic can be recycled. Plastics create solid waste problems when it is littered. A "Return-Deposit-Refund" scheme is recommended as an economic tool for driving the recycle economy. Customers are incentivised to return plastic bags and bottles to retail shops, from where it is collected and recycled or used as energy source in co-processing plants or Waste-to-Energy plants.
2. Plastics collected by Municipalities are shredded and supplied for use in road making. Chairman, KSPCB visited hotmix bitumen plants but could not observe admixture of plastic or find any feeding device for controlled addition for shredded plastics into asphalt.

D. E-waste Management Rules(Observations by KSPCB)

1. Electronic goods producers have notified collection centres for e-waste. The centres are few and far between. The locations are not advertised by producers. Consumers do not find it convenient and does not serve the purpose of E-waste management.
2. The Board is considering enforcing a 'Buy-back' scheme on manufacturers as part of Extended Producer Responsibility for collection of e-waste. The scheme will require producers to 'buy back' discarded products whatever its condition through all their retail outlets – single

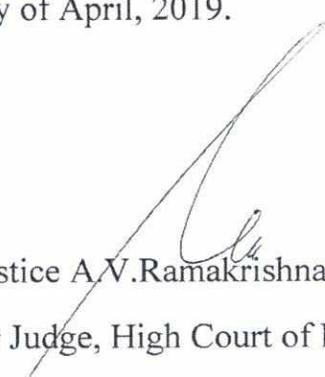
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brand or multi-brand. The products are transferred from retail outlets to collection centres and disassemblers.

E. Hazardous Waste Management Rules (Observations by KSPCB)

1. Kerala has one Hazardous Waste Landfill operated by KEIL at Ambalamedu. Hazardous waste landfill space is limited and expensive. Hazardous Waste Landfill should not be used for wastes other than hazardous wastes.
2. Hazardous waste co-processing in cement plant is allowed as per Clause 9(3). This option must be utilised as an environmentally desirable option. It is necessary to install facilities at Malabar Cements Ltd., (A Govt. of Kerala Enterprises), for co-processing of hazardous wastes.

Dated this the 22nd day of April, 2019.


Justice A.V. Ramakrishna Pillai,
(Former Judge, High Court of Kerala)
Chairman SLMC, Kerala

LOCAL SELF GOVERNMENT DEPARTMENT

The Government in the Local Self Government Department has formed Suchitwa Mission to provide Technical Support to Local Governments in the field of Sanitation and Waste Management sector. The Mission is established under the Travancore Cochin Literary Scientific and Charitable Societies Registration Act 1955 with Minister for Local Self Government as Chairman. The administration of the mission is done by an Executive Committee chaired by the Principal Secretary of the Local Self Government Department. The Mission has a Technical Support Group consisting of Executive Director, Directors and Programme Officers.

1. Strategy evolved for Solid Waste Management

In order to reduce the harmful health and environmental impacts of waste, the State is adopting the following strategy as declared in solid waste management policy.

1. Mandatory segregation of waste at source based on primary characteristics
2. Aerobic or anaerobic composting of biodegradable waste at source (household & institutions) as far as possible
3. Ensure decentralized community facilities for biodegradable waste that overflows from the household and institutional sources
4. Establish door to door collection of non-biodegradable waste from all sources for bulk handling and ensure their reuse and recycling to the maximum extent
5. Evolve a procedure for handling domestic hazardous waste and promote its implementation
6. Promote provision of storage bins for dumping wet and dry waste by all vendors and institutions including shops, retail joints, super markets, hotels, hospitals, railway and bus stations for the use public
7. Enforce captive waste management systems for the bulk waste generators
8. Promote modern centralized waste processing facilities in major cities using state of the art technologies
9. Make use of the enabling environment created under the Haritha Keralam Mission to integrate the use of treated waste products, enhance organic agriculture and upkeep of fragile ecosystems
10. Develop regional sanitary landfill facility to dispose of ultimately unusable materials
11. Prevent or discourage single use and throw away materials
12. Hygienic and aesthetic upkeep of public places by ensuring regular sweeping, cleaning and beautification
13. Enable the reuse, recycle and value addition of construction and demolition waste
14. Rationalize and strengthen the enforcement of rules and penalty provisions
15. Promote automated grievance redressal system for citizen
16. Undertake appropriate Information, Education and Communication campaign
17. Coordinate appropriate capacity building programmes for stakeholders
18. Develop appropriate community monitoring system for ensuring continual improvement in waste management
19. Network with academic and research & development institutions for updating of technologies and application protocols
20. Enlarge the service provider domain through encouraging start-ups among

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professionals and skilled youths

2. Technical Support

In order to implement the Solid Waste Management Rules, 2016, the Suchitwa Mission is mandated with the following roles and responsibilities.

1. Provide technical input and support to the local governments for establishing, operating and maintaining efficient and sustainable waste management facility;
2. Mobilize and augment additional financial support to local governments for setting up solid waste management facility through centrally sponsored and state sponsored schemes;
3. Specify scientific advisory and extend technical and financial assistance for handling and managing special waste such as plastic, domestic-hazardous, bio-medical, slaughter, electrical & electronic, battery and tyre wastes taking into consideration quantity, concentration, physical and chemical characteristics, biological properties through the general principle of reduce, reuse, recycle and recover;
4. Facilitate local governments to implement Extended Producer Responsibility for applicable special waste in consultation with the State Pollution Control Board;
5. Prepare and disseminate the standards and specifications as well as operation and maintenance protocol for different waste management system/tools;
6. Enable planning and preparation of master plan and detailed project reports for solid waste management and assist the local governments by issuing technical sanction;
7. Facilitate planning and implementation of solid waste management projects by arranging technical support to the local governments through accredited agencies, service providers, Haritha Sahaya Sthapanam (Green Support Institution), expert agencies etc.;
8. Function as the technical support agency for the Haritha Keralam Mission in the sector of waste management;
9. Facilitate integration of compost generation from biodegradable waste with organic cultivation at the local government level;
10. Assist to prevent waste flow to water bodies and other public spaces for ensuring the upkeep of environment;
11. Function as the nodal agency of the government in sanitation and waste management sector and liaison with pertinent state and central agencies for mobilizing technical and financial support;
12. Assist the different tiers of government to adopt the strategies put forward in the policy document and achieve the policy objectives;
13. Monitor the progress of implementation of solid waste management activities through appropriate Management Information System (MIS) and assist the government for taking corrective measures, wherever required;
14. Evaluate the technologies adopted for solid waste management and upgrade them taking into consideration the updated scientific inputs;
15. Carry out surveys and studies pertaining to waste management sector and use the information gathered for improvisation of the sector;
16. Scout for state of the art technologies and operational guidelines and enable the local governments and support institutions to adapt the feasible ones.

3. Actions taken

Some of the recent actions taken by the Government in the Local Self Government Department are given hereunder.

- Vide Government Circular No. 82200/DC1/2014/LSGD dated 15-02-2016 all Grama Panchayats, Municipalities and Municipal Corporations are directed to promote source level segregation (House hold and Institutional Level) of biodegradable and non-biodegradable waste and manage it effectively. All Grama Panchayats, Municipalities and Municipal Corporations are also directed to ensure the treatment of biodegradable waste through composting or bio-methanation methods at all households and institutions by themselves.
- Vide G. O (P) no.65/2018/LSGD dated 13/09/18, the state government have notified a policy of the state on Solid Waste Management in terms of Rule 11 & 15 of Solid Waste Management Rule, 2016.
- Vide G. O (Rt) no.2420/2017/LSGD dated 15/07/17, Government has issued an order regarding an operational guideline for the implementation of Harithakeralam Mission initiatives in the state stating the responsibility of the citizen, conducive environment towards responsible waste management practices to create an own culture of the state in waste management, assist LSGIs for creating the presumed culture in SLWM etc.
- Vide G. O (P) no.10/2017/ P&EA dated 15/07/17, Government has issued an order regarding the guideline explaining the vision, planning, operation and assistance related to the development missions formulated as part of the Navakeralam programme
- Vide GO. No. 3214/2017/LSGD dt. 5.10.2017 Secretariat, Collectorate and Other Govt.
- Departments are to comply with Green Protocol
- Vide GO. No. 387/2018/LSGD dt. 8.2.2018 VGF earmarked to Clean Kerala Company for operating Resource Recovery Facility
- Vide Govt. Circular No C2/274/2017/I & PRD dated 14/02/18 Government has issued a circular directing all Govt.department to avoid use of flex board for the promotion of all government sponsored programmes
- Vide Circular No. 176/DC1/2018/LSGD dt. 4.5.2018, Green Protocol is implemented in Govt. Departments
- Vide G. O (Ms) no.82/2018/LSGD dated 11/06/18 – Government has accorded sanction for establishing 5 MW solid waste-to-Energy plants in 7 districts on Design, Build, and Finance, Operate and Transfer basis through public Private Partnership and entrusted KSIDC to float Request for Proposal
- Vide G. O (Rt) no.2142/2018/LSGD dt. 3.8.2018 – Government has accorded sanction for providing 100% of government assistance against project cost for installing WM Plants in Govt./aided Institutions, Hospitals, Quarters etc. which are unable to have any source of fund
- Vide GO No. 5784/2018/LSGD dated 4.9.2018 orders issued making Green Protocol compulsory for Govt. organized programmes and meetings.
- Vide GO No. 2400/2018/LSGD dt. 10.9.2018 Local Bodies are permitted to implement SLWM projects utilizing 100% fund from the SBM (G) scheme.

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- Vide GO. No. 3687/2018/LSGD dated 15.11.2018 100% subsidy is provided for setting up composting units in public institutions
- Vide G. O (Rt) no.3281/2018/LSGD dated 31/12/2018 Government has accorded sanction for providing 90% of govt. subsidy for the projects formulated by LSGIs for installing source level waste management devices like bio-gas plants and composting devices.
- Vide G.O.(Rt) No. 194/2019/LSGD dt. 29.1.2019 accorded sanction for setting up of modern waste to energy biogas plants of 2 ton/day capacity through GPS Renewables Bangalore at Perinthalmanna on pilot basis.
- Vide G.O (Ms) No. 13/2019/LSGD dt. 1.2.2019 accorded sanction for setting up waste to energy plant at Munnar on Build, Own, Operate and Maintain (BOOM) basis by M/s. AG Dauters Waste Processing Pvt. Ltd. in the land provided by M/s. Kannan Devan Hills Plantation Company Pvt Ltd. without adopting tender process.
- Vide G. O (Rt) no.470/2019/LSGD dated 01/03/2019, administrative sanction is issued by the govt. for the setting up of Septage Treatment Plants in various LSGIs for an amount of Rs. 150 crore by utilizing financial assistance from KIIFB
- Vide GO No. 71/2019/LSGD dt 1.3.2019 operating cost for Haritha Sahaya Sthapanam sanctioned

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4. Status of Implementation

No.	Strategy	Method for compliance	Status of compliance
1	Segregation of waste at source	The State is promoting Overflow Waste Management system, thereby the order of priority is to treat the biodegradable waste at the sources itself. The sources include households, institutions and community spots. If biodegradable waste overflows from the above sources, they will be treated at decentralized or centralized facilities. Door to door collection of non-biodegradable waste is facilitated through Haritha Karma Sena (HKS).	About 4 lakh households, 30,000 institutions and 2000 community locations have facilities for treating biodegradable waste. Therefore, these locations practice segregation of waste at source. Segregation is also complied with by 62 Urban Local Governments (ULGs) and 484 Grama Panchayats (GPs) as door to door collection of segregated non-biodegradable waste is operational there through HKS.
2	Treatment of waste at source	Aerobic or anaerobic composting of waste at the source itself such as households and institutions using Kitchen bin, Pipe composting kit, Pot composting kit, Ring Composting kit, Bio bins, biogas plants etc.	Aerobic composting facility is installed in about 4 lakh houses, 29420 institutions. Biogas plants are installed in 84218 houses and 1339 institutions. In addition, about 30 lakh households are composting their waste in uncovered composting pits. Overall, 2597 ton of biodegradable waste is treated at households and institutions on a daily.
3	Ensure decentralized community facilities for treatment of biodegradable waste	The biodegradable waste that overflow from households and institutions and that generated at the community places such as markets etc. to be treated by establishing treatment facilities using Biobins, Thumburmoozhi composting shed, Organic waste converter, large biogas plants etc.	Decentralized composting facilities are established at 2003 community places such as markets and large biogas plants are established at 132 locations. Together these plants treat about 410 ton of biodegradable waste per day. In addition, centralized composting plants are operation

4	Establish door-to-door collection of non-biodegradable waste	This is to be facilitated by establishing Haritha Karma Sena (HKS), an enterprise group formed through the Kudumbasree by charging a user fee. In order to operationalize the group, Government decided to provide a viability gap support to the HKS for the first 6 months. The HKS is to be trained and their operation ensured through a technical support mechanism namely Haritha Sahaya Sthapanam (HSS).	91 out of 93 ULGs and all the 941 GPs have taken actions to form HKS. However, 457 GPs and 31 ULGs, HKS are yet to be operational. In 62 Urban Local Governments (ULGs) and 484 Grama Panchayats (GPs), door to door collection of segregated non-biodegradable waste is operational. The system has to be improved with the support of 36 identified HSS, who are non-governmental technical support group.
5	Evolve procedure for handling domestic hazardous waste	A common procedure is yet to be evolved. A scientific facility for landfilling the hazardous waste is operational at Brahmapuram, Kochi by the Kerala Enviro Infrastructure Ltd. which could be linked to the disposal of domestic hazardous waste.	Currently a few ULGs are collecting the domestic hazardous waste through collection campaigns as is done in Thiruvananthapuram Corporation. Most of the domestic hazardous waste are collected through Scrap dealers. Discussions have been done with the Scrap dealers association and they are being enlisted and issued identity cards by the Suchitwa Mission for transparent action. The Clean Kerala Company now collect E-waste from the local governments and institutions who gather them. During post-flood, the non-biodegradable waste mixed with domestic hazardous waste were disposed off in the scientific hazardous waste landfilling facility.
6	Promote provision of storage bins for storage of wet and dry waste by	This is to be ensured through all the vendors including shops, retail joints, super markets, hotels, hospitals, railway and bus stations for the use public	Action has to be initiated for improved compliance

7	Enforce captive waste management systems for the bulk waste generators	IEC activities and promotional efforts are being taken to persuade all bulk waste generators to manage their waste.	Most of the bigger hotels, marriage halls, high-rise apartment complexes have waste management systems established. However, the exact level is not assessed. It is also advisable that the Pollution Control Board (PCB) and Local Self Govt (LSG) institutions may link the compliance requirement with consent to operate issued by the PCB and/or renewal of license by the LSGs
8	Promote modern centralized waste processing facilities	Govt. plans to establish Waste to Energy Plants in major cities using state of the art technologies through Design, Build, Finance, Operate and Transfer basis.	Government accorded sanction for establishing 5 MW solid waste-to-Energy plants in 7 districts through Public Private Partnership and entrusted KSIDC to float Request for Proposal. Accordingly, waste to energy plant at Njeliyanparamba, Kozhikkode Corporation is in the tendering stage. Kochi Corporation entered into an agreement with M/s. GJ Power Ltd. to establish a 300 tpd waste to energy plant. A 5 tpd modern biogas plant is being installed at Sultan Batheri Municipality of Wayanad. Prior to 2012, there were 31 Centralized composting plants managing about 1100 ton per day of waste, many of them closed down due to O&M failure or judicial intervention and currently 8 Centralized composting plants are operational handling about 430 tpd of waste.
9	Integrating the use of treated waste products	Govt. established an enabling mission namely Haritha Keralam Mission to integrate the activities of waste management, water conservation and organic cultivation. Accordingly, composting is promoted for production of manure and use it for organic cultivation.	Prepared an inventory households, institutions and community places where composting is undertaken and compost is generated. The details, including the LSGI where the facility operates, the quantity of waste treated and quantity of compost generated have been provided to Agriculture Department for Agricultural Officers at the LSGIs to facilitate the use of compost. The compost generated in about 5 lakh households and 31000 institutions are mostly used within the premises. The compost generated at about 2035 locations are distributed locally. In

			<p>addition, there are 8 Centralized composting plants, the compost generated are sold from the plants for agricultural purposes.</p>
10	Disposal of ultimately unusable materials	Development of regional sanitary landfill facility is necessary to dispose of the reject left after composting and reuse-recycling process	<p>Study conducted by the World Bank for the Suchitwa Mission recommended 6 regional sanitary landfill facility in the state. Based on the criteria for locating sanitary landfill sites and using satellite data, probable for sites for 6 regional landfills were located. Detailed study was conducted to establish a pilot sanitary landfill in Palakkad district, but the Committee appointed by the District Collector found the land to be unsuitable. In order to establish sanitary landfill in Thiruvananthapuram and Kollam, work was started at Vilappilsala and Kureeppuzha, but had to be abandoned due to public protest and judicial intervention.</p>

11	Prevention or discouraging of single use and throw away materials	Implementation of Plastic Waste Management Rules, 2016 and Green Protocol campaign.	Various awareness campaign has been organized for enforcement of plastic waste management rules. Green protocol campaign has been taken up to reduce waste generation particularly to prevent the use of single use and throw away materials and promoting the use of recyclable materials. All Government Offices and supported institutions are asked to adopt green protocol. 215 state level offices out of 399 have completed first level activities in the green office campaign. 756 district level offices out of 1114 have completed first level activities in green office campaign. 190 Block level offices out of 358 have completed first level activities in green office campaign. 17 major functions including Attukal Pongala and 11 state level functions by Govt departments organizes programmes observing green protocol. 1161 offices have initiated complying with green protocol.
12	Hygienic and aesthetic upkeep of public places	Regular sweeping, cleaning and beautification of roads and public places.	All the Corporations and Municipalities except the new ones engage sanitary workers and sweep the main roads on a regular basis and sub-roads on a regular basis. Govt. proposes to provide sweeping machines to major corporations to introduce mechanized sweeping on an experimental basis during 2019-20.
13	Reuse, recycle and value addition of construction and demolition waste	Implementation of Construction and Demolition waste management rules, 2016	Govt. proposes to establish a facility in collaboration with major stakeholders for management of construction and demolition waste such as building materials, debris, rubbles resulting from construction, re-modelling, repair and demolition of any civil structure of individual or organisation or authority.

14	Rationalize and strengthen the enforcement of rules and penalty provisions	Awareness building and enforcement actions	Series of awareness campaign has been taken up for informing the public on the provisions of various rules to prevent indiscriminate disposal and burning of waste. Haritha Keralam Mission in coordination with various agencies including the Pollution Control Board has taken up a training programme to stakeholders involved in environmental upkeep programmes. In compliance to the direction of the Hon'ble High Court of Kerala, an Executive directive has been issued through Police Department, against dumping and burning of waste, on 14.11.2016. The Kerala Irrigation and Water Conservation (Amendment) Act has been amended in 2018 to incorporate increased penal provisions for preventing waste dumping in water bodies.
15	Promote automated grievance redressal system for citizen	Making use of use of ICT Solutions	Swachatha App is introduced by the Ministry of Housing and Urban Affairs, GoI that could be used by all the ULBs in the country for registering sanitation related issues and get it resolved. The usage of the application for registering the complaints and resolving the issue is very minimal which has to be improved. Thiruvananthapuram Corporation has introduced Smart Trivandrum application which facilitate the use of waste management system operated by the Corporation
16	Information, Education and Communication campaign	Making use of use of ICT Solutions	Suchitwa Mission, Haritha Keralam Mission, Pollution Control Board, Local Governments are organizing various IEC programmes.

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17	Capacity Building Programmes	Appropriate Capacity Building Programs are organized through Kerala Institute of Local Administration (KILA) and concerned organizations	KILA organizes training for elected representatives, Secretaries, Health Officials, Engineers, Haritha Karma Sena etc. on a regular basis. In addition, specialized training is organized by concerned agencies. About 450 capacity building programmes have been organized during the current year.
18	Community monitoring system	Design, develop and operationalize appropriate system for ensuring continual improvement in waste management	A system has to be planned and institutionalized linking Residential Associations
19	Networking Academic and Research & Development institutions	Involving academic institutions for updating technologies and application protocols	The State Level Expert Committee has been constituted with experts from academic and R&D institutions. Suchitwa Mission have constituted two Technical Committees, one for Solid Waste Management and the other for Liquid Waste Management. Further, supports are obtained from academic community for introducing new technologies and procedures for waste management. Suchitwa Mission collaborates with Kerala Agricultural University, Kerala Veterinary and Animal Sciences University, Kerala Technology University, Centre for Water Resources Development and Management, National Centre for Earth Sciences, National Institute of Interdisciplinary Science & Technology and many other Non-Governmental Research and Extension institutes.

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20	Enlisting more service providers, particularly start-ups	Enlarge the service provider domain through encouraging start-ups among professionals and skilled youths	The proposals on new technologies and new technology and service providers are enlisted after scrutiny and evaluation by a technical committee
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Executive Director
Suchitwa Mission

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Details of Municipal Solid Waste generated per day and other related details

District	Total no of ULBs	Total quantity of waste generated per day(in ton)	No. of ULBs where mandatory segregation of waste at source is being done	No. of ULBs where source level composting facility (aerobic or anaerobic) for the processing of biodegradable waste (Household / Institution /Community level) is available	No of ULBs where such facility is not available	No of ULBs where door to door collection of non-biodegradable waste from all sources is available	No of ULBs where such facility is not available	No of ULBs where captive waste management system is enforced for the bulk waste generators in ULBs	No of ULBs where Haritha Karma Sena is formed, trained and started functioning	No of ULBs having dumping areas where heaps of accumulated solid waste on streets and public places	Quantity of waste accumulated in such areas (in ton)	No of ULBs where Material Collection Facility (MCF) is available	No of ULBs where Resource Recovery Facility (RRF) is available
Thiruvananthapuram	5	726	Seperately attached	5	0	5	0	4	4	2	0.5	4	7
Kollam	5	464		4	1	5	0	2	4	1	0.3	5	5
Pathanamthitta	4	362		4	0	4	0	2	2	0	0	3	3
Alappuzha	6	379		4	2	5	1	1	3	0	0	4	4
Kottayam	6	464		4	2	5	1	2	5	0	0	3	1
Idukki	2	187		2	0	2	0	2	1	0	0	2	2
Ernakulam	14	758		8	6	10	4	6	6	2	12	7	6
Thrissur	8	426		6	2	6	2	5	4	2	2.25	4	6
Palakkad	7	394		6	1	6	1	1	6	3	21.52	6	6
Malappuram	12	387		11	1	11	1	11	7	0	0	6	2
Kozhikode	8	526	7	1	6	2	2	8	2	5.05	6	2	

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EXHIBIT X (A)

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Details of Municipal Solid Waste generated per day and other related details

Wayanad	3	259		1	2	2	1	2	1	0	0	2	0
Kannur	10	482		9	1	7	3	8	10	3	42	8	7
Kasaragod	3	162		3	0	3	0	2	1	0	0	2	2
	93	5976		74	19	77	16	50	62	15	83.62	62	53

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Details of Municipal Solid Waste generated per day and other related details

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District	No of ULBs where centralised waste management facility is available	The fine imposed for the dumping of waste in public places and water bodies	No. of ULBs having public protest	Are the waterbodies clean	Septage Treatment Plant	Sewerage Treatment Plant
Thiruvananthapuram	1	284600	0	(No) 4	0	1
Kollam	1	650124	1	(No) 3	1	1
Pathanamthitta	1	116450	0	(No) 5	0	0
Alappuzha	0	279430	0	(No) 5	0	0
Kottayam	0	158100	0	(No) 5	3	3
Idukki	0	169705	0	(No) 1	0	0
Ernakulam	2	345470	1	(No) 10	1	0
Thrissur	4	392470	1	(No) 4	0	3
Palakkad	3	285500	0	(No) 7	0	0
Malappuram	3	1095660	0	(No) 10	0	1
Kozhikode	1	80250	1	(No) 5	0	0
Wayanad	1	164100	0	(No) 3	0	0
Kannur	3	844670	0	(No) 8	0	1
Kasaragod	1	90000	0	(No) 2	0	1
	21	4956529	4		5	11

Details of Segregation of Solid Waste in Urban Local Bodies						
Corporations (6 Nos.)						
Sl No	Name of Corporation	Total No. of wards	No of wards where 100% segregation is done	Percentage	No. of wards where 100% segregation not done	Percentage
1	Kozhikode Corporation	75	55	73.33	20	26.67
2	Thiruvananthapuram Corporation	100	50	50.00	50	50.00
3	Kannur Corporation	55	21	38.18	34	61.82
4	Kollam Corporation	55	3	5.45	52	94.55
5	Kochi Corporation	74	2	2.70	72	97.30
6	Thrissur Corporation	55	0	0.00	55	100.00
	TOTAL	414	131	31.64	283	68.36

District Headquarters & Towns with 1 lakh population

Sl No	Name of ULB	Total No. of wards	No of wards where 100% segregation is done	Percentage	No. of wards where 100% segregation not done	Percentage
1	Palakkad	52	52	100.00	0	0.00
2	Thalasserry	52	52	100.00	0	0.00
3	Malappuram	40	25	62.50	15	37.50
4	Ponnani	51	20	39.22	31	60.78
5	Kalpetta	28	7	25.00	21	75.00
6	Kasaragod	37	8	21.62	29	78.38
7	Alappuzha	52	8	15.38	44	84.62
8	Kottayam	52	2	3.85	50	96.15
9	Pathanamthitta	32	0	0.00	32	100.00
10	Thodupuzha	35	0	0.00	5	100.00
	TOTAL	431	174	40.37	257	59.63

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Urban Agglomeration (Kochi)

Sl No	Name of ULB	Total No. of wards	No of wards where 100% segregation is done	Percentage	No. of wards where 100% segregation not done	Percentage
1	Thrikkakara	43	43	100.00	0	0.00
2	Aluva	26	26	100.00	0	0.00
3	Eloor	31	30	96.77	1	3.23
4	Tripunithura	49	1	2.04	48	97.96
5	Maradu	33	0	0.00	33	100.00
6	Kalamasserry	42	0	0.00	42	100.00
	TOTAL	224	100	44.64	124	55.36

Urban Agglomeration (Kozhikode)

Sl No	Name of ULB	Total No. of wards	No of wards where 100% segregation is done	Percentage	No. of wards where 100% segregation not done	Percentage
1	Feroke	38	38	100.00	0	0.00
2	Quilandy	44	42	95.45	2	4.55
3	Ramanattukara	31	0	0.00	31	100.00
	TOTAL	113	80	70.80	33	29.20

Other Urban Local Bodies

Sl No	Name of ULB	Total No. of wards	No of wards where 100% segregation is done	Percentage	No. of wards where 100% segregation not done	Percentage
1	Varkala	33	33	100.00	0	0.00
2	South Paravoor	32	32	100.00	0	0.00
3	Punalur	35	35	100.00	0	0.00
4	Kottarakkara	29	29	100.00	0	0.00
5	Thiruvalla	39	39	100.00	0	0.00
6	Vaikom	26	26	100.00	0	0.00
7	Chavakkad	32	32	100.00	0	0.00
8	Kunnamkulam	37	37	100.00	0	0.00
9	Ottapalam	36	36	100.00	0	0.00
10	Chittur-Thathamangala	29	29	100.00	0	0.00

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11	Cherpulasserry	33	33	100.00	0	0.00
12	Tirurangadi	39	39	100.00	0	0.00
13	Kondotty	40	40	100.00	0	0.00
14	Vadakara	47	47	100.00	0	0.00
15	Payoli	36	36	100.00	0	0.00
16	Sulthan Bathery	35	35	100.00	0	0.00
17	Mattannur	35	35	100.00	0	0.00
18	Thaliparamba	34	34	100.00	0	0.00
19	Payyannur	44	44	100.00	0	0.00
20	Panoor	40	40	100.00	0	0.00
21	Anthur	28	28	100.00	0	0.00
22	Neelewsaram	32	32	100.00	0	0.00
23	Mukkam	34	33	97.06	1	2.94
24	Shornur	33	31	93.94	2	6.06
25	North Paravur	29	26	89.66	3	10.34
26	Nedumangad	39	23	58.97	16	41.03
27	Koduvally	36	19	52.78	17	47.22
28	Attingal	31	14	45.16	17	54.84
29	Pala	26	11	42.31	15	57.69
30	Perinthalmanna	34	14	41.18	20	58.82
31	Piravam	27	10	37.04	17	62.96
32	Nilambur	60	22	36.67	38	63.33
33	Kodungallur	44	14	31.82	30	68.18
34	Koothuparambu	28	7	25.00	21	75.00
35	Chalakkudy	36	8	22.22	28	77.78
36	Iritty	33	4	12.12	29	87.88
37	Angamaly	30	3	10.00	27	90.00
38	Vadakkancherry	41	3	7.32	38	92.68
39	Chenganur	27	1	3.70	26	96.30
40	Sreekandapuram	30	1	3.33	29	96.67
41	Neyyattinkara	44	0	0.00	44	100.00
42	Karunagappally	35	0	0.00	35	100.00
43	Adoor	28	0	0.00	28	100.00
44	Pandalam	33	0	0.00	33	100.00
45	Kayamkulam	44	0	0.00	44	100.00
46	Mavelikkara	28	0	0.00	28	100.00

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47	Cherthala	35	0	0.00	35	100.00
48	Haripad	29	0	0.00	29	100.00
49	Changanasserry	37	0	0.00	37	100.00
50	Erattupetta	28	0	0.00	28	100.00
51	Ettumanoor	35	0	0.00	35	100.00
52	Kattappana	34	0	0.00	34	100.00
53	Muvattupuzha	28	0	0.00	28	100.00
54	Kothamangalam	31	0	0.00	31	100.00
55	Perumbavoor	27	0	0.00	27	100.00
56	Koothattukulam	25	0	0.00	25	100.00
57	Irinjalakkuda	41	0	0.00	41	100.00
58	Guruvayoor	43	0	0.00	43	100.00
59	Pattambi	28	0	0.00	28	100.00
60	Mannarkkad	29	0	0.00	29	100.00
61	Tirur	38	0	0.00	38	100.00
62	Kottakkal	32	0	0.00	32	100.00
63	Manjeri	50	0	0.00	50	100.00
64	Valancherry	33	0	0.00	33	100.00
65	Tanur	44	0	0.00	44	100.00
66	Parappanangadi	45	0	0.00	45	100.00
67	Manathavadi	36	0	0.00	36	100.00
68	Kanhangad	43	0	0.00	43	100.00
	TOTAL	2372	1015	42.79	1357	57.21

Total No of wards	3554.00	Percentage
No of wards where 100% segregation is done	1500.00	42.21
No. of wards where 100% segregation not done	2054.00	57.79

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Gramapanchayat wise details of Solid Waste generation and related matters

District	Number of Grama Panchayats	Total quantity of waste generated per day (in ton)	Number of Panchayats where mandatory segregation of waste at source is being done	No. of Panchayats where such segregation facility is not available	Number of Panchayats where source level composting facility (aerobic or anaerobic) for the processing of biodegradable waste (Household/institution/community level) is available	No of panchayats where such facility is not available .	Number of Panchayats where facility to door to door collection of non biodegradable waste from all sources is available	Details of Panchayats where such facility is not available	No of Panchayats where captive waste management system is enforced for the bulk waste generators in respective Panchayats	No. of Panchayats where Haritha Karma Sena is formed, trained and started functioning	Whether there is dumping areas where heaps of accumulated waste on streets and public places	Quantity of waste accumulated in such dumping areas (in ton)	No of Panchayats having public protest,	No of Panchayats where Material Collection facility (MCF) is available	No of Panchayats where Resource Recovery Facility (RRF) is available
Thiruvananthapuram	73	787	39	34	73	0	39	34	25	41	No	0	0	11	5
Kollam	68	392	42	26	34	34	66	2	23	51	No	0	0	19	6
Pathanamthitta	53	342	38	15	50	3	51	2	27	50	Yes	0.51	1	40	3
Alappuzha	72	265	39	33	46	26	45	27	16	20	Yes	26	0	32	4
Kottayam	71	296	43	28	59	12	58	13	21	41	Yes	1	0	43	8
Idukki	52	65	19	33	38	14	30	22	9	16	Yes	3	0	26	4
Ernakulam	82	445	58	24	64	18	37	45	30	34	Yes	6	2	36	4
Thrissur	86	390	22	64	64	22	36	50	0	22	Yes	0.47	0	0	9

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EXHIBIT-XI(C)

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Palakkad	88	268	11	77	28	60	12	76	10	31	Yes	70	1	27	5
Malappuram	94	206	66	28	59	35	31	63	0	22	No	0	0	0	3
Kozhikode	70	287	57	13	69	1	66	4	32	70	No	0	1	29	2
Wayanad	23	82	13	10	14	9	11	12	7	10	No	0	0	19	2
Kannur	71	216	63	8	67	4	66	5	22	66	No	0	0	67	8
Kasaragod	38	77	14	24	18	20	14	24	0	10	No	0	0	15	1
TOTAL	941	4118	524	417	683	258	562	379	222	484		107	5	364	64

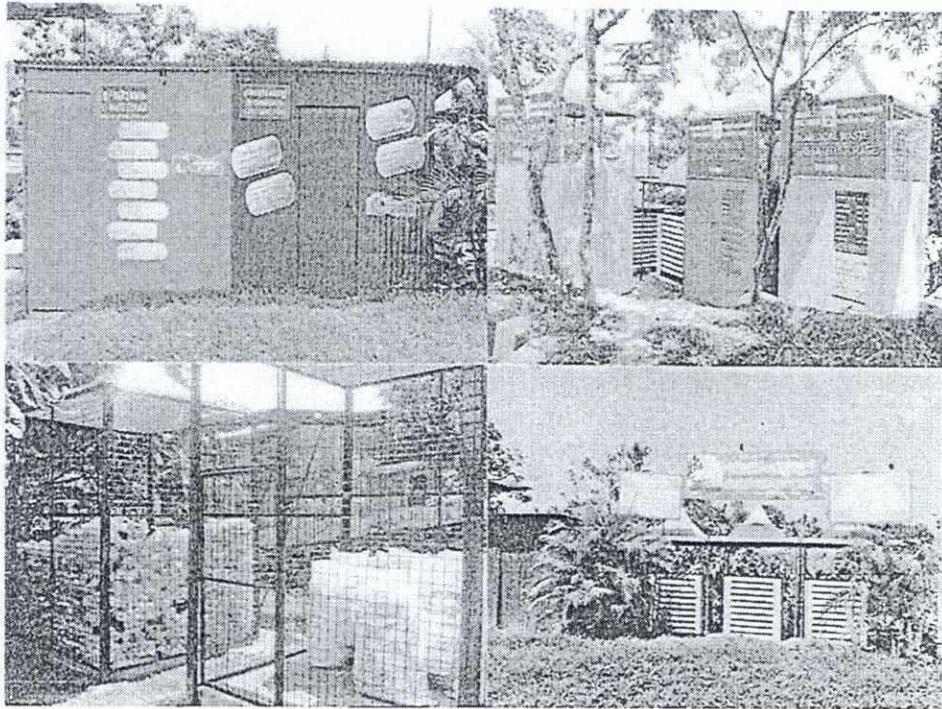
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District	Fine imposed (local bodywise) for the dumping of waste in public places and water bodies.	Are the water bodies clean? (no solid waste thrown into water bodies)	No of Panchayats where waste management facility is available
Thiruvananthapuram	75000	No	0
Kollam	31600	No	0
Pathanamthitta	0	Yes	0
Alappuzha	3000	No	0
Kottayam	6000	Yes	4
Idukki	101000	Yes	9
Ernakulam	55151	No	13
Thrissur	0	No	0
Palakkad	30000	No	3
Malappuram	0	Yes	0
Kozhikode	272600	No	0
Wayanad	31600	Yes	0
Kannur	353900	Yes	3
Kasaragod	52000	Yes	0
TOTAL	1011851		32

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Proposed Action
for
Implementation of
Environmental Protection Legislations
in Government owned
Health Care Institutions

Health & Family Welfare Department

Government of Kerala



INDEX

1. REPORT of ACTION TAKEN BY HEALTH & FAMILY WELFRE DEPARTMENT
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Report on the action taken by the Health and Family Welfare Department, Government of Kerala for implementation of Bio Medical Waste Management Rule 2016 and Solid Waste Management Rule 2016

I. Background

The Hon'ble NGT vide order dated 16-01-2019 in OA No: 606/2018 ordered for reporting compliance of Biomedical Waste Management Rule 2016 and Municipal Solid Waste Management Rule 2016 in the State of Kerala. The Health and Family Welfare Department Govt. of Kerala is hereby submitting an Action Taken Report for implementing the above mentioned Rules in the State by the Health and Family Welfare Department as per the orders of the Hon'ble National Green Tribunal.

As per the Rule 4, of the Bio medical Waste Management Rule 2016, the Occupier (Head of the Hospital) is responsible for implementation of the Rules in Government owned health care institutions. As per the schedule I, of the Rules, segregated storage of waste in colour coded containers is his responsibility. The Occupier is also responsible for providing on-site storage facility, treatment and disposal facility as per schedule I of the Rules. It is also the primary responsibility of the occupier is to ensure training and immunisation of workers, use of non-chlorinated and bar coded plastic bag for storage of waste, take authorisation from Pollution Control Board, furnishing of Annual Report to the State Pollution Control Board etc.

As per the Rule 12(3), the State Government has to constitute an Advisory Committee to review all matters related to implementation of provisions of Bio medical Waste Management Rule and as per the Rule 12(4), the State Government has to constitute District Level Monitoring Committee under the Chairmanship of District Collectors for reviewing and monitoring the activities of implementation of Bio medical Waste Management Rules in the districts.

In brief, the following are the responsibility of the State Government in the Health and Family Welfare Department:

- To ensure implementation of the rule in all healthcare facilities or occupiers.
- Allocation of adequate funds to Government health care facilities for bio-medical waste management.

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- Procurement and allocation of treatment equipments and make provision for consumables for bio-medical waste management in Government health care facilities.
- Constitute State or District Level Advisory Committees under the District Magistrate or Additional District Magistrate to oversee the biomedical waste management in the Districts.
- Coordinate with the State Pollution Control Boards or Pollution Control Committees on implementation of these Rules.
- Implementation of recommendations of the Advisory Committee in all the health care facilities.

As per Schedule III of Bio medical Waste Management Rule, 2016 the following are the responsibility of Municipalities, Municipal Corporations and Grama Panchayats in the State:

- Provide or allocate suitable land for development of common bio-medical waste treatment facilities in their respective jurisdictions as per the guidelines of Central Pollution Control Board.
- Collect other solid waste (other than the biomedical waste) from the health care facilities as per the Municipal Solid Waste (Management and handling Rules), 2000 or as amended time to time.
- Any other function stipulated under these Rules.

II. Action Taken Report

In the above background, I am submitting herewith Action Taken Report on implementation of Bio medical Waste Management Rule 2016 and related provisions applicable for health care institutions specified under the Municipal Solid Waste Management Rule 2016, pertaining to the State of Kerala:

1. It is submitted that right from the year 1998, the State of Kerala has initiated action for implementing the Biomedical Waste Management Rule (Management and handling Rules), 1998. The Government owned health care institutions in Kerala had taken necessary action at that time itself for implementing the said Rules. The Government hospitals have provided with facilities for source storage of waste in colour coded containers / bags as specified in the above mentioned Rules. The Government hospitals had joined the Common Treatment and Disposal Facility (CTDF) established by Indian Medical Association at Palakkad (IMAGE) for managing biomedical waste generated in the health care institutions. This was the first PPP mode project in the Health Sector in Kerala and perhaps in the country. The operator of the common facility is providing colour coded containers / bags to all health care institutions right from PHC, CHC, and FHC to the level of Medical Colleges on chargeable basics. The common operator is collecting biomedical waste from the door step of all hospitals and treating and disposing the waste in their Common Treatment Facility operating at Palakkad, Kerala. Now as per the provisions of Biomedical Waste Management Rule 2016, the operator of the common facility is issuing bar coded bags as specified in the Rule to all Government owned Health Care Institutions after charging a cost for that. The State Government is supporting and motivating the Government owned Health Care Institutions for compiling with provisions of the Rules and for providing proper waste management facilities as per the BMW Rules.

As the number of beds have increased, the capacity expansion is essential. All the agencies IMA and Government are actively following up to develop few more centers at different sites in the State and do capacity expansion.

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2. It is submitted that about 85% of the waste generated in health care institutions is non-bio medical waste ie. general Waste. The health care institutions in the State are provided sufficient facilities for source level segregation and storage of General Waste and it is also submitted that as per Schedule III (Rules 6 and 9(3)), the Urban and Rural Local Bodies are responsible for collecting solid waste other than bio medical waste from Health Care Institutions as per Municipal Solid Waste Management Rule 2016. But due to public protest / lack of treatment facilities for collection, treatment and disposal of Solid Waste, the local bodies in the State are lagging behind in putting up scientific mechanism of disposal of waste by collecting General Waste from most of the health care institutions. The problem has been noted by the Occupiers of the health care institutions and they are managing general waste to the extent possible by establishing onsite biogas plants and appropriate compost units. In many institutions, the Local Self Government Institutions have collaborated and funded the waste disposal mechanisms. The department is documenting the success stories and sharing with other LSGIs to encourage them to do decentralized waste disposal facilities in the Government Health Institutions.

4. The issues with respect to the waste management are very acute in Kerala because of geographical, environmental factors which is further aggravated by the peoples approach towards waste disposal and the NIMBY syndrome "Not In My Back Yard". However the department is taking various approaches to engage with the community and make them aware that waste handling is essential to prevent various communicable diseases, zoonotic diseases epidemics. The Jagritha campaign launched by Hon Chief Minister successfully for the past years. Under this campaign year long activities regarding prevention of epidemic are undertaken. A major activity is generating awareness regarding spread of disease and prevention of diseases. It necessary focus on solid waste and liquid waste management at all levels from the wards in Panchayath to the Corporation. With such community involvement at many places LSGI have come forward, the community participated and developed good waste management facilities.

3. It is submitted that as per the orders of the Hon'ble National Green Tribunal the Principal Secretary, Health and Family Welfare Department, Government of Kerala with the support of experts from State Pollution Control Board had organised a one day

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online Workshop on 28-03-2019, utilising the Smart Class Room set up by the Department of Rural Development at Swaraj Bhavan, Nanthancode, Thiruvananthapuram for the concerned officers right from Health Inspectors up to the level of Head of health care institutions, by inviting them to attend the Workshop at two or three centres in each districts. The Principal Secretary explained about the necessity on implementation of orders of Hon'ble NGT related to management of General Waste in the Government owned health care institutions and offered all support from the Government side for implementing the provisions of the said Rules .Thereafter experts from State Pollution Control Board presented about technical and viable options for managing different types of waste generated in health care institutions including general waste. The last session was an interactive session led by the Principal Secretary, Health and Family Welfare Department and the experts with participants stationed at all districts and cleared their doubts.

The Department of Health will keep doing capacity building of the functionaries handling waste related activities at the Health Institutions. This will enable at local level meaningful engagement with other stake holders including Local Self Government Institutions, civil society and community at large.

4. It is submitted that the concerned officers and staffs are thereby made aware of the orders of the Hon'ble NGT and made them responsible for implementation of Bio medical Waste Management Rules 2016 and directed them to take action for implementation General Waste Management activities as per the Rules. A format was provided to all health care institutions containing in all three tiers of PHC/ CHC / FHC, General Hospital/District Hospital / W&C Hospitals and Medical Colleges for collecting present status of waste management activities in the Government owned Hospitals.

5. It is submitted that the present status of implementation of Bio medical Waste Management Rules 2016 and facilities available in the hospitals are being collected from the Institutions. The format of the data collection is attached for ready reference.

Annexure I

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6. Considering the orders of the Hon'ble NGT, the State Government is proposing to establish a Waste Management Cell (WMC) in NHM for co-ordinating and supporting the waste management activities, in principle decision has been taken to establish the cell headed with an expert who had experience in the field and qualification as Senior Environmental Engineer. The WMC will formulate an Action Plan in consultation with various stakeholders in Directorates, Health Institutions and LSGIs for implementing waste management activities in all health care institutions in the State. The Unit will provide technical support for preparation of proposal and implementation of Solid and Liquid waste management projects in the Government owned health care institutions functioning at primary, secondary and tertiary level. The funding for the same shall be pooled from all available sources from state plan, LSGIs, CSR and voluntary organizations, etc.

7. It is submitted that, legally it is the responsibility of rural and urban local bodies in the State to collect and manage general waste from all health care institutions. But considering the present situation in the State for the management of Municipal Solid Waste, hospitals themselves are taking various actions for managing easily degradable part of general waste (food waste and vegetable waste) at the compound of hospitals to the extent possible and action has already been taken establishing onsite Biogas plants. It is also proposed to utilise bio gas generated for hot water generation and for utilisation of that resource in the hospital.

8. It is submitted that Government Hospitals are planning to provide onsite aerobic compost facilities (Thumboormuzhi) which is found to be technically viable and feasible in the State for managing not easily biodegradable part of the waste to the extent possible. The facility is expected to manage plantain leaf- Sweeping waste especially tree leaf, bushes etc.

9. It is submitted that the Government health care institutions are planning to establish Material Collection Facility (MCF) for collecting and storage of non-biodegradable waste such as plastics, metals, glass, e-waste and other discarded material including packaging waste. The MCF is proposed to be established in the Taluk/ District and Medical College Hospitals. Materials collected from the MCF especially plastics are

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bailed for reducing volume and it is proposed to handover to recyclers /common facility established by group of Municipalities/ Grama Panchayats. The ultimate aim is to recover resource from the materials and to avoid open burning of general waste at the Government Hospitals. Some of the LSGIs have come together and put up such plastic management units in the Health Institutions.

10. It is submitted that the Waste Management Cell formed in the Health Department will support the Government owned health care institutions for implementing the solid and liquid waste management activities in compliance with the legislations and to initiate actions for implementing the projects in a time bound manner. Proposed action plan in this regards is attached as **Annexure II**.

11. The data of the institutions gathered so far is appended as an **Annexure III**. We plan to validate the data by undertaking repeat situational analysis. With this information we will develop the plan of actions to fill up the gaps in the respective health institutions by doing analysis of gravity of situation to enable us to prioritize activities depending on the fund availability.

12. It is submitted that there are some good model Waste Management Facilities in some of the Government hospitals in the State. A short presentation of the model facilities is attached as **Annexure IV**. These models can be emulated to other hospitals in a time bound manner.

The presentation copy of the Action taken so far and the proposed strategy, capacity building efforts and the action plan is attached as an **Annexure V**.

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III. Conclusion

The Health and Family Welfare Department, Government of Kerala has initiated actions for supporting the Government owned health care institutions to manage the Solid and Liquid Waste generated in their institutions in compliance with the Rules.

The waste management in the State is a very difficult task from the point of view of availability of space and vacant fallow lands, as available in other states and people's approach towards it. In spite of the constraints, earnest efforts are being taken with community participation at the grass roots to ensure proper waste management.

A sensitisation Workshop for Officers of Healthiness Care Institutions has been conducted on 28.03.2019. Base line data on present status of waste management from health Care institutions is being collected. Details of Model Waste Management Facilities established and operating successfully in Government owned Health care Institutions has been collected and planned to replicate in other places.

The various institutions facilities reflect the commitment of health functionaries of the institutions, LSGIs and other social organization. It also indicates integrated approach towards waste management by putting up decentralized mechanism. The most important point to note is the community participation in the development of one of the most important community assets i.e. Health Institution.

It is propose to support the Health Care Institutions to prepare proposal with technical support of experts and to implement the proposal in a time bound manner. An action Plan for short term and long term activities in this regard need to be prepared for ensuring time bound implementation of the Waste Management Facilities in Government owned heath Care institutions.

The scientific waste management will require sustained efforts from the Health department, Government supportive policies to prioritize funding for the same, continuous engagement with the community and advocacy with other important stake holders such as Local Self Government, technology providers, Corporates, social organizations and community at large to participate in protecting the environment.

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Ultimate aim of these efforts is to motivate and support the Occupier of Government Hospitals to implement the Biomedical Waste Management Rules and connected Rules in a sustainable manner within two years as per the orders of Hon'ble NGT.

Dr Rajan Khobragade
Prl Secretary H&FW

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1. ANNEXURE I – FORMAT TO COLLECT THE DATA FROM THE
HEALTH INSTITUTIONS

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DETAILS OF HEALTH CARE INSTITUTIONS UNDER HEALTH AND FAMILY WELFARE
DEPARTMENT
GOVERNMENT OF KERALA

Sl. No.		
1	Name and type of HCF Hospital -Medical College/GH/DH/THQH/W&CH	
2	Name, Ph. No. and E-mail id of Head of institution	
3	No. of beds	
4	Average No. of patients treated per month as In-Patients	
5	Method of disposal of Bio Medical Waste Disposal	
6	Bio Medical Waste Disposal	
6.1	Whether affiliated to Common Bio Medical Waste Treatment Facility (of IMAGE)	
6.2	Own Waste Management Facilities provided in the Hospital premises. If so, provide the following details: (Number &Capacity) •Incinerators •Autoclaves	

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	<ul style="list-style-type: none"> • Microwave - for sterilizing waste before disposing • Shredder • Needle tip cutter or destroyer • Sharps encapsulation • concrete pit • Deep burial pits • Chemical disinfection • Any other treatment equipment 			
6.3	Disposal of expired Medicines			
	<ul style="list-style-type: none"> • Mode of disposal of expired Medicines • Is there a committee for disposal of expired Medicines 			
6.4	Quantity of Bio Medical Waste handled, segregated, treated or disposed			
	Category	Type of waste	Quantity	Method of

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			Generated or Collected, kg/day	Treatment and Disposal (Refer Schedule-I)
(1)	(2)		(3)	(4)
Yellow	(a) Human Anatomical Waste:			
	(b) Animal Anatomical Waste :			
	(c) Soiled Waste:			
	(d) Expired or Discarded Medicines:			
	(e) Chemical Solid Waste:			
	(f) Chemical Liquid Waste :			
	(g) Discarded linen, mattresses, beddings			

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		(h) Microbiology, Biotechnology and other clinical laboratory waste:		
	Red	Contaminated Waste (Recyclable)		
	White (Translucent)	Waste sharps including Metals:		
	Blue	Glassware		
		Metallic Body Implants		
6.5	No of trainings conducted on Bio Medical Waste			
6.6	Number of directions/Notice issued from KSPCB to the hospital			

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7.65

6.7	How is Bio Medical Waste and General Waste separated in the hospital	
7	Sewage Disposal	
7.1	Quantity of sewage generated	
7.2	Whether STP provided	
7.3	Capacity of STP	
7.4	Details of STP	
7.5	Mode of disposal of treated effluent	If connected to sewer line whether preliminary treatment plant is provided
7.6	Whether consent obtained from Board. If Yes, Consent details	
7.7	Number of directions/Notice issued from KSPCB	
8	Quantity of solid waste as per Solid Waste	

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27.09.20

	Management Rule				
8.1	Quantity of Bio Degradable Waste				
8.2	Quantity of Non Bio Degradable Waste				
9	Proposed action for waste and sewage management				
	Sl.No.	Proposed action	Fund required	Funding agency	Time line for implementation

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ANNEXURE II – ACTION PLAN TIME LINE MATRIX

General Solid Waste & Liquid Waste Management in Hospitals

Time schedule for Implementation of Waste management in Hospitals

		Duration In Months (Starting from April 2019 and ending on March 2021)																			
Sl No	Activity	April May June	July August September	Oct November December	January February March	April May June	July August September	Oct November December	January February March												
		2019	2019	2019	2020	2020	2020	2020	2020	2021											
1	Formation of Waste management cell	█																			
2	Sensitisation workshop		█																		
3.	Missing Data Collection			█																	

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Duration In Months (Starting from April 2019 and ending on March 2021)

Sl No	Activity	April May June		July August September		Oct November December		January February March		April May June		July August September		Oct November December		January February March	
		2019		2019		2019		2020		2020		2020		2020		2021	
4	Data compilation			—													
5	Formulation of model proposal																
	i. Biogas plant																
	ii. Compost Unit				—												
	iii. Material Collection Facility																

4.59

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Submitted to Ministry covering from April 2019 and ending on March 2021

Sl No	Activity	April May June		July August September		Oct November December		January February March		April May June		July August September		Oct November December		January February March	
		2019		2019		2019		2020		2020		2020		2020		2021	
6	Project Formulation Workshop				—												
7	Preparation of proposals						—	—									
8	Seeking AS & TS								—	—							
9	Seeking funds from LSGD/Suchitwa mission/KSP CB/NHM/Other Agencies									—	—						

7. 30-

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Duration in Months (Starting from April 2019 and ending on March 2021)

	Activity	April May June		July August September		Oct November December		January February March		April May June		July August September		Oct November December		January February March	
		2019		2019		2019		2020		2020		2020		2020		2021	
10	Starting implementati on																
11	Completion of project																
12	Monitoring & Evaluation																

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ANNEXURE III- DATA TABLES

Details of Waste Management from Government Health Care Institutions

Table 1

Sl No	Name of Institution	No of Beds	Mode of BMW Disposal	Quantity of Solid General waste disposal	Mode of liquid waste Disposal
1.	Taluk Head quarters Hospital, Malayinkil, Trivandrum	58	IMAGE 50 kg per day	12 kg per day	Septic Tank 3000 L/day
2.	General Hospital ,Muvattupuzha	266	IMAGE 268 kg per day	300 kg per day	Septic Tank 3000 L/day
3.	Taluk Hospital, Palluruthy, Ernakulam	50	IMAGE 15 kg per day	6 kg per day	Septic Tank 5000 L/day
4.	Taluk Hospital, Ernakulam	41	IMAGE 24 kg per day	20 kg per day	Septic Tank 5000 L/day
5.	Primary Health Centre, Moonniyur, Malappuram District	0	IMAGE 1kg per day	3 kg per day	Septic Tank 500 L/day
6.	FHC, Pandalam, Pathanamthitta	5	IMAGE 2 kg per day	3.5 kg per day	Septic Tank 600 L/day
7.	Taluk Hospital, Panathady	35	IMAGE 15 kg per day	9.5 kg per day	Septic Tank 4000 L/day
8.	CHC Enadimangalam	24	IMAGE 9 kg per day	6 kg per day	Septic Tank 3000 L/day
9.	CHC Thumpamon	0	IMAGE 2 kg per day	1.5 kg per day	Septic Tank 500 L/day
10.	Primary Health Centre, Perayam	0	IMAGE 1 kg per day	1.5 kg per day	Septic Tank 500 L/day
11.	CHC Pandappilly	30	IMAGE 36 kg per day	10 kg per day	Septic Tank 6000 L/day

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12	CHC KANJEETTUKARA	30	IMAGE 12 kg per day	6 kg per day	Septic Tank 6000 L/day
13	PHC Nediyruppu	1	IMAGE 2.5 kg per day	7 kg per day	Septic Tank 500 L/day
14	TALUK HEAD QUARTERS HOSPITAL, TRIPUNITHURA	146	IMAGE 37 kg per day	32 kg per day	Septic Tank 10,000 L/day
15	PHC Vallarpadam	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500 L/day
16	PHC NETTOOR	12	IMAGE 2 kg per day	5 kg per day	Septic Tank 1500 L/day
17	PHC PANDALAM THEKKEKARA	1	IMAGE 1 kg per day	1 kg per day	Septic Tank 500 L/day
18	PHC RANNI - ANAGADI	0	IMAGE 1 kg per day	1 kg per day	Septic Tank 500 L/day
19	Primary Health centre Kalloorcad	30	IMAGE 30 kg per day	3 kg per day	Septic Tank 7000 L/day
20	CHC Kalakkode	12	IMAGE 2 kg per day	8 kg per day	Septic Tank 2500 L/day
21	CHC Ayarkunnam	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500 L/day
22	FAMILY HEALTH CENTRE, CHENNEERKKARA	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500 L/day
23	CHC KALLOPPARA	1	IMAGE 1.75 kg per day	2 kg per day	Septic Tank 500 L/day
24	CHC VECHOOCHIRA	24	IMAGE 4.5 kg per day	2 kg per day	Septic Tank 5000 L/day
25	CHC Vallana	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500 L/day

26	PHC Ranni Pazhavangadi	0	IMAGE 1.0 kg per day	2 kg per day	Septic Tank 550 L/day
27	PHC Pamboor	0	IMAGE 1.5 kg per day	1.5 kg per day	Septic Tank 500 L/day
28	Taluk Hospital, Mallapally	48	IMAGE 31 kg per day	10 kg per day	Septic Tank 6000 L/day
29	PHC CHIRAKKARA	0	IMAGE 1.5 kg per day	1.5 kg per day	Septic Tank 500 L/day
30	Primary health centre, Okkal	0	IMAGE 1.0 kg per day	2 kg per day	Septic Tank 550 L/day
30	PHC Panangad	0	IMAGE 1.5 kg per day	2.5kg per day	Septic Tank 600 L/day
31	PHC CHOKKAD	4	IMAGE 2.5 kg per day	2.5kg per day	Septic Tank 700 L/day
32	General Hospital ,Kalpetta	110	IMAGE 75 kg per day	58 kg per day	Septic Tank 15,000 L/day
33	Primary Health Centre ,Kadammanitta	0	IMAGE 1.0 kg per day	2 kg per day	Septic Tank 550 L/day
34	PHC, Kulanada	0	IMAGE 1.5 kg per day	205 kg per day	Septic Tank 570 L/day
35	COMMUNITY HEALTH CENTRE Koothattukulam	40	IMAGE 22 kg per day	16 kg per day	Septic Tank 5,400 L/day
36	PHC Omalloor	0	IMAGE 1.0 kg per day	2 kg per day	Septic Tank 550 L/day
37	CHC Kunnamthanam	0	IMAGE 1.0 kg per day	2 kg per day	Septic Tank 550 L/day
38	PHC Mezhuveli	0	IMAGE 1.5 kg per day	3 kg per day	Septic Tank 600 L/day

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10	PHC Mallapuzhassery	0	IMAGE 1.0 kg per day	2 kg per day	Septic Tank 550 L/day
10	PHC Malayalapuzha	0	IMAGE 1.5 kg per day	3 kg per day	Septic Tank 600 L/day
11	FHC PAIPRA	0	IMAGE 1.5 kg per day	3 kg per day	Septic Tank 600 L/day
12	FHC KOTTANGAL	0	IMAGE 1.5 kg per day	3 kg per day	Septic Tank 600 L/day
13	PHC CHANDANAPALLY	0	IMAGE 1.0 kg per day	2 kg per day	Septic Tank 600 L/day
14	FHC K S Puram	0	IMAGE 1.0 kg per day	10 kg per day	Septic Tank 600 L/day
15	Primary Health Centre Varavoor	0	IMAGE 1.5 kg per day	8 kg per day	Septic Tank 600 L/day
16	Primary Health Centre Marady	0	IMAGE 1.0 kg per day	3 kg per day	Septic Tank 600 L/day
17	primary health center ,varadoor,wayanad	0	IMAGE 1.0 kg per day	3 kg per day	Septic Tank 700 L/day
18	CHC ELANTHOOR	0	IMAGE 1.0 kg per day	2 kg per day	Septic Tank 500 L/day
19	Govt.Medical College,Ernakulam	500	IMAGE 150 kg per day	100 kg per day	STP 500 KLD
20	primary health centre Anicadu	0	IMAGE 1.5kg per day	12 kg per day	Septic Tank 500 L/day
21	Primary Health Centre Thannithode	6	IMAGE 2 kg per day	2 kg per day	Septic Tank 550 L/day
22	Taluk Hospital Perambra	38	IMAGE 30 kg per day	28 kg per day	Septic Tank 7000 L/day

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53	Govt. Medical College Hospital, Thrissur	1150	IMAGE 2000 kg per day	1800 kg per day	STP 2 MLD
54	COMMUNITY HEALTH CENTER Trikkannapuram	12	IMAGE 5.5 kg per day	20 kg per day	Septic Tank 800 L/day
55	PHC NARANAMMOOZHAY	0	IMAGE 2 kg per day	6 kg per day	Septic Tank 500 L/day
56	Urban Primary Health Centre, Kumbazha	0	IMAGE 2 kg per day	6 kg per day	Septic Tank 500 L/day
57	PHC Vellangallur	0	IMAGE 2 kg per day	6 kg per day	Septic Tank 500 L/day
58	PHC pavaratty	10	IMAGE 5 kg per day	6 kg per day	Septic Tank 600 L/day
59	Community Health Centre, Mullassery	36	IMAGE 31 kg per day	18 kg per day	Septic Tank 6000 L/day
60	General Hospital ,Pathanamthitta	414	IMAGE 220 kg per day	280 kg per day	STP 240 KLD
61	Taluk Head Quarters Hospital Ottapalam	173	IMAGE 180 kg per day	200 kg per day	STP 50 KLD
62	Thaluk hospital ,pudukad	75	IMAGE 60 kg per day	72 kg per day	STP 5 KLD
63	CHC Chungathara	10	IMAGE 6 kg per day	8 kg per day	Septic Tank 7000 L/day
64	Taluk hospital	26	IMAGE 18 kg per day	18 kg per day	Septic Tank 9000 L/day
65	CHC varappuzha	12	IMAGE 26 kg per day	20 kg per day	STP 6 KLD
66	Mental health centre ,thrissur	361	IMAGE 7.5 kg per day	30 kg per day	Septic Tank 15,000 L/day

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67	PHC manjalloor	24	19 kg per day	20 kg per day	Septic Tank 9000 L/day
68	COMMUNITY HEALTH CENTRE Meenangadi	16	28 kg per day	34 kg per day	Septic Tank 8,000 L/day
69	Taluk Hospital, Ranni	105	60 kg per day	98 kg per day	STP 60 KLD
70	Taluk Hospital, Konni	24	20 kg per day	28 kg per day	Septic Tank 9,000 L/day
71	FHC Paralam	0	IMAGE 2 kg per day	6 kg per day	Septic Tank 500 L/day
72	TALUK HEAD QUARTERS HOSPITAL, Sulthan Bathery	128	IMAGE 54 kg per day	110 kg per day	STP 120 KLD
73	PRIMARY HEALTH CENTRE, VENKITANGU	0	IMAGE 2 kg per day	6 kg per day	Septic Tank 500 L/day
74	PRIMARY HEALTH CENTER Nattika	24	IMAGE 32 kg per day	54 kg per day	Septic Tank 9000 L/day
75	District Hospital Mananthavady	274	IMAGE 600 kg per day	700 kg per day	STP 300 KLD
76	A A RAHIM MEMORIAL DISTRICT HOSPITAL, KOLLAM	537	IMAGE 203 kg per day	300 kg per day	Septic Tank 26,000 L/day
77	PHC Thottappuzhaserry	0	IMAGE 5 kg per day	5.5 kg per day	Septic Tank 600 L/day
78	Phc Kappukunnu	0	IMAGE 2 kg per day	1.5 kg per day	Septic Tank 550 L/day
79	PHC MUNDATHIKODE	0	IMAGE 2 kg per day	1.5 kg per day	Septic Tank 550 L/day
80	District Hospital Aluva	227	IMAGE 200 kg per day	600 kg per day	Septic Tank 550 L/day

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81	PHC Manjanikkara	1	IMAGE 2 kg per day	1.5 kg per day	Septic Tank 550 L/day
82	PHC ELAVALLY	0	IMAGE 2.5 kg per day	1.5 kg per day	Septic Tank 560 L/day
83	CHC VELINALLOOR	35	IMAGE 29 kg per day	45 kg per day	Septic Tank 10,600 L/day
84	PHC Mankulam	0	IMAGE 2.5 kg per day	1.5 kg per day	Septic Tank 560 L/day
85	PHC Sakthikulangara	0	IMAGE 2.5 kg per day	1.5 kg per day	Septic Tank 560 L/day
86	Govt. Taluk Hospital Attingal	60	IMAGE 61 kg per day	50 kg per day	Septic Tank 17,000 L/day
87	Taluk Head Quarters Hospital Mannarkkad	123	IMAGE 90 kg per day	110 kg per day	Septic Tank 22,000 L/day
88	CHC meppady	24	IMAGE 20 kg per day	40 kg per day	Septic Tank 9,000 L/day
89	Primary Health Centre , Peruva	0	IMAGE 2.0 kg per day	1.5 kg per day	Septic Tank 500 L/day
90	Primary health centre Eloor	3	IMAGE 2.0 kg per day	1.5 kg per day	Septic Tank 500 L/day
91	CHC Thalakulathur	18	IMAGE 18 kg per day	29 kg per day	Septic Tank 5000 L/day
92	FHC KANCHIYAR	24	IMAGE 20 kg per day	40 kg per day	Septic Tank 9,000 L/day
93	CHC KUMBALANGHY	32	IMAGE 28 kg per day	50 kg per day	Septic Tank 12,000 L/day
94	CHC Varapetty	24	IMAGE 20 kg per day	40 kg per day	Septic Tank 9,000 L/day

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91	Taluk Head quarters Hospital Adimaly	100	IMAGE 50 kg per day	110 kg per day	Septic Tank 30,000 L/day
92	CHC NJARACKKAL	40	IMAGE 30 kg per day	90 kg per day	Septic Tank 15,000 L/day
93	General Hospital Adoor	300	IMAGE 210 kg per day	350 kg per day	Septic Tank 45,000 L/day
94	CHC KOODALLOOR	32	IMAGE 12 kg per day	40 kg per day	Septic Tank 8,000 L/day
95	PUTHUPPADI PHC	0	IMAGE 2.0 kg per day	1.5 kg per day	Septic Tank 500 L/day
96	PHC VALANTHAKAD	0	IMAGE 2.0 kg per day	1.5 kg per day	Septic Tank 550 L/day
97	CHC KALIKAVU	28	IMAGE 11 kg per day	35 kg per day	Septic Tank 7,000 L/day
98	COMMUNITY HEALTH CENTRE PANOOR	50	IMAGE 29 kg per day	50 kg per day	Septic Tank 13,000 L/day
99	PHC KAMAKSHYT	10	IMAGE 9 kg per day	35 kg per day	Septic Tank 4000 L/day
100	CHC KOODALLOOR	52	IMAGE 31 kg per day	50 kg per day	Septic Tank 13,000 L/day
101	CHC THIRUVALLUR	24	IMAGE 13 kg per day	35 kg per day	Septic Tank 7,000 L/day
102	PRIMARY HEALTH CENTRE MUDAKUZHA	0	IMAGE 2.0 kg per day	1.5 kg per day	Septic Tank 550 L/day
103	PHC Valakom	24	IMAGE 10 kg per day	28 kg per day	Septic Tank 5000 L/day
104	CHC ELAMDESAM	0	IMAGE 1.5 kg per day	1.5 kg per day	Septic Tank 500 L/day

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108	FHC Vengapally	0	Deep burial 1kg per day	0.500 kg per day	Septic Tank 400 L/day
109	PHC Chakkupallam	0	Deep burial 0.50kg per day	0.500 kg per day	Septic Tank 400 L/day
110	Taluk Headquarters Hospital, North Paravur	155	IMAGE 215 kg per day	70 kg per day	STP 100KLD
111	PHC Andathode	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
112	PHC KONNATHADY	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
113	Community Health Centre , Arunoottimangalam	24	IMAGE 11 kg per day	28 kg per day Pipe compost	Septic Tank 400 L/day
114	PHC Pampadumpara	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
115	Community Health Centre, Chengamanad	14	IMAGE 8 kg per day	14 kg per day	Septic Tank 800 L/day
116	Che Chithirapuram	34	IMAGE 19 kg per day	30 kg per day	Septic Tank 1200 L/day
117	U K Nayanar Memoriyal Govt. W&C Hospital Mangattuparambakannur	100	IMAGE 50 kg per day	90 kg per day Pad incinerator	STP 50 KLD
118	Community Health Centre	30	IMAGE 19 kg per day	30 kg per day	Septic Tank 1200 L/day
119	Primary Health Centre Thaikkad, Thrissur	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 700 L/day
120	Phc Poomala	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
121	Primary Health Centre Elambulassery	10	No IMAGE Deep burial method 1.5 kg	3 kg per day	Septic Tank 800 L/day

122	chc nariikuni	30	IMAGE 10 kg per day	30 kg per day	Septic Tank 1200 L/day
123	Thaluk Hospital Bedadka	24	IMAGE 11 kg per day	28 kg per day	Septic Tank 400 L/day
124	Taluk Head Quarters Hospital Kuthuparamba	75	IMAGE 40 kg per day	50 kg per day	STP 30KLD
125	Primary Health Center Deviyar Colony	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
126	PHC Kottanadu	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
127	CHC Tanur	42	IMAGE 20 kg per day	30 kg per day	Septic Tank 1200 L/day
128	Primary Health center Paippally, Kollam	24	IMAGE 11 kg per day	28 kg per day	Septic Tank 1500 L/day
129	PHC Kadapra	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
130	CHC Vatanappilly	24	IMAGE 11 kg per day	28 kg per day	Septic Tank 9000 L/day
131	Taluk Hospital Chelakkara	32	IMAGE 18 kg per day	35 kg per day	Septic Tank 10,000 L/day
132	Phc Binanipuram	24	IMAGE 12 kg per day	30 kg per day	Septic Tank 9000 L/day
133	Taluk Hospital Balussery	75	IMAGE 50 kg per day	80kg per day	Septic Tank 18000 L/day
134	District Hospital Kozhencherry	237	IMAGE 150 kg per day	200kg per day	Septic Tank 50,000 L/day
135	PHC AYYAPPANCOIL	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day

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136.	District Hospital Thodupuzha,	144	IMAGE 50 kg per day	100kg per day	Septic Tank 30,000 L/day
137.	Primary Health Centre , Kattampak	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
138.	Taluk Head quarters Hospital, PATTAMBI	76	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
139.	PHC Peruvayal	0	No IMAGE Deep burial method 1.5 kg	1 kg per day	Septic Tank 400 L/day
140.	PRIMARY HEALTH CENTRE CHEMPAKAPPARA	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
141.	Govt Tribal Hospital, Nalloorad	30	IMAGE 10 kg per day	25 kg per day	Septic Tank 15,000 L/day
142.	Govt. Maharaja's Taluk Hospital, Karavelippady	220	IMAGE 100 kg per day	200 kg per day	Septic Tank 70,000 L/day
143.	chc thariode	40	IMAGE 10 kg per day	25 kg per day	Septic Tank 10,000 L/day
144.	CHC Chathenkary	24	IMAGE 10 kg per day	5 kg per day	Septic Tank 10,000 L/day
145.	Primary health centre, velloor	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
146.	Primary Health Centre Nedumbassery	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
147.	PHC PERUVANTHANAM	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
148.	CHC THIRUVILWAMALA	30	IMAGE 10 kg per day	5 kg per day	Septic Tank 10,000 L/day
149.	PRIMARY HEALTH CENTRE POOCHAPRA	0	No IMAGE Deep burial method 1.5 kg	1 kg per day	Septic Tank 400 L/day

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150.	Primary Health Centre Edavanakad	2	No IMAGE Deep burial method 1.5 kg	1 kg per day	Septic Tank 400 L/day
151.	CHC PINARAYI	32	IMAGE 10 kg per day	5 kg per day	Septic Tank 10,000 L/day
152.	COMMUNITY HEALTH CENTRE ALAPAD	31	IMAGE 10 kg per day	5 kg per day	Septic Tank 10,000 L/day
153.	Primary Health Centre, Kunnukara	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
154.	Taluk Head quarters Hospital VAIKOM	272	IMAGE 150 kg per day	100 kg per day	Septic Tank 50,000 L/day
155.	PHC kuttoor	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
156.	PHC RAYAMANGALAM	20	IMAGE 8 kg per day	5 kg per day	Septic Tank 10,000 L/day
157.	PRIMARY HEALTH CENTER PARAKKADAVU	0	No IMAGE Deep burial method 1.5 kg	1 kg per day	Septic Tank 400 L/day
158.	PHC Panangad	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
159.	PHC Chemmalassery	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
160.	PHC NAYARAMBALAM	0	No IMAGE Deep burial method 1.5 kg	1 kg per day	Septic Tank 400 L/day
161.	PHC Mundankunnu	20	IMAGE 8 kg per day	5 kg per day	Septic Tank 10,000 L/day
162.	PHC ERAMAM-KUTTUR	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
163.	PHC Alappad	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day

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164.	PHC CHAMAKKALA	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
165.	PHC MADAVOOR	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
166.	PRIMARY HEALTH CENTER VALAD	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
167.	chc cherpu	82	IMAGE 50 kg per day	70 kg per day	Septic Tank 40000 L/day
168.	Taluk Head quarters Hospital PEERMADE	54	IMAGE 20 kg per day	30 kg per day	Septic Tank 20,000 L/day
169.	Family Health Centre Muttom	16	IMAGE 5 kg per day	8 kg per day	Septic Tank 8000 L/day
170.	INSTITUTE OF CHILD HEALTH, AMALAGIRI, KOTTAYAM	203	IMAGE 100 kg per day	180 kg per day	Septic Tank 60000 L/day
171.	Primary Health Centre Vazhavatta	10	IMAGE 5 kg per day	8 kg per day	Septic Tank 5000 L/day
172.	PHC, CHULLIODE	0	No IMAGE Deep burial method 1.5 kg	1 kg per day	Septic Tank 400 L/day
173.	CHC VELLANIKKARA	6	IMAGE 5 kg per day	8 kg per day	Septic Tank 5000 L/day
174.	COMMUNITY HEALTH CENTRE PERINJANAM	36	IMAGE 12 kg per day	21 kg per day	Septic Tank 5000 L/day
175.	Family Health Centre Ennappara	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
176.	Primary Health Centre Avoly	0	No IMAGE Deep burial method 1.5 kg	1 kg per day	Septic Tank 400 L/day
177.	chc karunapuram	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day

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178.	FHC desamangalam	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
179.	GENERAL HOSPITAL KANJIRAPALLY	142	IMAGE 50 kg per day	100 kg per day BIOGAS	STP 120 KLD
180.	phc padijarathara	0	No IMAGE Deep burial method 1.5 kg	1 kg per day	Septic Tank 400 L/day
181.	FHC CHATHANNOOR	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
182.	Primary Health Centre, Dharmadam	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
183.	PHC Ayyampilly	51	No IMAGE Deep burial method 1.5 kg	1 kg per day	Septic Tank 400 L/day
184.	PHC Vellathooval	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
185.	CHC.MYNAGAPPALLY	24	IMAGE 10 kg per day	18 kg per day	Septic Tank 8000 L/day
186.	FHC KODIKULAM	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
187.	phc koorkanchery	0	No IMAGE Deep burial method 1.5 kg	1 kg per day	Septic Tank 500 L/day
188.	Taluk Hospital, Piravom	93	IMAGE 20 kg per day	5 kg per day	Septic Tank 20,000 L/day
189.	Govt. Medical College Thiruvananthapuram	3656	IMAGE 20 kg per day	Bio Gas plants 2600 kg per day	Sewer line 80 0000 litre
190.	Primary Health Centre Alangad	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
191.	FAMILY HEALTH CENTRE IDAVAKA	20	IMAGE 5 kg per day	10 kg per day	Septic Tank 4000 L/day

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192.	CHC PURAPUZHA	6	IMAGE 5 kg per day	10 kg per day	Septic Tank 4000 L/day
193.	PHC Elappara	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
194.	KALAMASSERY PRIMARY HEALTH CENTRE	0	No IMAGE Deep burial method 1.5 kg	1 kg per day	Septic Tank 500 L/day
195.	CHC ANANDAPURAM	12	No IMAGE Deep burial method 5 kg	10 kg per day	Septic Tank 5000 L/day
196.	PRIMARY HEALTH CENTRE KAVIYOOR	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 500 L/day
197.	Taluk Head quarters Hospital vythiri	129	IMAGE 50 kg per day	100 kg per day	STP 100KLD
198.	PHC SANTHANPARA	0	No IMAGE Deep burial method 1.5 kg	1 kg per day	Septic Tank 500 L/day
199.	PHC THALAPPALAM	0	No IMAGE Deep burial method 1.5 kg	1 kg per day	Septic Tank 500 L/day
200.	Taluk Head quarters Hospital NEDUMKANDAM	106	IMAGE 50 kg per day	100 kg per day	Septic Tank 60,000 L/day
201.	PHC POZHUTHANA	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
202.	Taluk Hospital Puthenvelikkara	48	No IMAGE Deep burial method 5 kg	20 kg per day	Septic Tank 20000 L/day
203.	PRIMARY HEALTH CENTRE KANDANASSERY	0	No IMAGE Deep burial method 1.5 kg	1 kg per day	Septic Tank 500 L/day
204.	PHC Niranam	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
205.	COMMUNITY HEALTH CENTRE PAZHAYNNUR	58	No IMAGE Deep burial method 15 kg	21 kg per day	Septic Tank 20000 L/day

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206.	PHC Nedumpuram	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
207.	Taluk Head quarters Hospital payyanur	150	IMAGE 40 kg per day	100 kg per day	Septic Tank 40,000 L/day
208.	PRIMARY HEALTH CENTRE, MANAKKAD	1	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 500 L/day
209.	PHC Orumanayur	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
210.	COMMUNITY HEALTH CENTRE KODUVALLY	30	IMAGE 5 kg per day	10 kg per day	Septic Tank 15000 L/day
211.	PHC PRAMADOM	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
212.	fhc chathanoor	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
213.	P H C POZHICKARA	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
214.	PHC MOONNILAVU	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
215.	FHC UDUMBANCHOLA	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
216.	phc munabam	61	No IMAGE Deep burial method 5 kg	15 kg per day	Septic Tank 20,000 L/day
217.	PHC ALAKKOD	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
218.	PRIMARY HEALTH CENTRE AYYANTHOLE	0	No IMAGE Deep burial method 1.5 kg	1 kg per day	Septic Tank 500 L/day
219.	Phc avinisery	0	No IMAGE Deep burial method 1.5 kg	1 kg per day	Septic Tank 500 L/day

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220.	DISTRICT HOSPITAL IDUKKI	192	IMAGE 50 kg per day	100 kg per day	Septic Tank 1,00,000 L/day
221.	PHC VAZHATHOPE	0	No IMAGE Deep burial method 1.5 kg	1 kg per day	Septic Tank 500 L/day
222.	PHC THIDANADU	0	No IMAGE Deep burial method 1.5 kg	1 kg per day	Septic Tank 500 L/day
223.	PHC SUGANDAGIRI	0	No IMAGE Deep burial method 1.5 kg	1 kg per day	Septic Tank 500 L/day
224.	PHC Mullankolly	0	No IMAGE Deep burial method 1.5 kg	1 kg per day	Septic Tank 500 L/day
225.	INSTITUTE OF CHEST DISEASES DME Medical College	110	IMAGE 50 kg per day	100 kg per day	Septic Tank 800,000 L/day
226.	TALUK HEAD QUARTERS HOSPITAL KOYILANDY	159	IMAGE 90 kg per day	100 kg per day	Septic Tank 800,000 L/day
227.	Government general Hospital Kozhikode	550	IMAGE 200 kg per day	300 kg per day	Septic Tank 10,00,000 L/day
228.	Primary Health Centre Chandanapally	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
229.	chc erumapetty	10	No IMAGE Deep burial method 5 kg	8 kg per day	Septic Tank 4500 L/day
230.	PHC KARIMKUNNAM	1	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
231.	COMMUNITY HEALTH CENTRE PORUNNANNORE	40	IMAGE 5 kg per day	181 kg per day	Septic Tank 15000 L/day
232.	FHC MARIYAPURAM	3	IMAGE 1 kg per day	1.5 kg per day	Septic Tank 500 L/day
233.	TALUK HEAD QUATERS HOSPITAL VYTHIRI	129	IMAGE 50 kg per day	101 kg per day	Septic Tank 60,000 L/day

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234.	Government Medical college Hospital Kollam	350	IMAGE 100 kg per day	240 kg per day	STP 900 KLD
235.	Taluk Head quarters Hospital Thiruvalla	173	IMAGE 80 kg per day	120 kg per day	Septic Tank 30,000 L/day
236.	PHC Poothrikka	0	No IMAGE Deep burial method 1.5 kg	1 kg per day	Septic Tank 500 L/day
237.	FHC PERUVANTHANAM	0	IMAGE 0.50 kg per day	1 kg per day	Septic Tank 400 L/day
238.	PHC ATHIRAMPUZHA	46	IMAGE 10 kg per day	30 kg per day	Septic Tank 30,000 L/day
239.	PHC KANAKKARI	0	No IMAGE Deep burial method 1.5 kg	1 kg per day	Septic Tank 500 L/day
240.	Taluk Head quarters Hospital Kuttiady	104	IMAGE 60 kg per day	70 kg per day	STP 50000KLD
241.	PHC Cheruvattoor	1	No IMAGE Deep burial method 1.5 kg	1 kg per day	Septic Tank 500 L/day
242.	CHC KALADY	32	IMAGE 10 kg per day	25 kg per day	Septic Tank 20,000 L/day

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Details of Waste Management from Government Health Care Institutions

Table 2

Sl No	Name of institution	No of beds	Quantity/ mode of BMW waste disposal	Quantity of Solid General waste disposal	Mode of Liquid waste Disposal
1	phc valanchery	16	IMAGE 8 kg per day	15 kg per day	Septic Tank 3000 L/day
2	PHC CHINNAKANAL	0	IMAGE 1.5 kg per day	1.5 kg per day	Septic Tank 400 L/day
3	PHC THRIPRANGOTTUR	0	IMAGE 1.5 kg per day	1.5 kg per day	Septic Tank 500 L/day
4	PHC VALLICODU	24	IMAGE 8 kg per day	10 kg per day	Septic Tank 5000 L/day
5	PHC MARUTHOMKARA	0	IMAGE 0.5 kg per day	1.5 kg per day	Septic Tank 400 L/day
6	TALUK HEAD QUARTERS HOSPITAL alathur	154	IMAGE 30 kg per day	80 kg per day Napkin destroyer	Septic Tank 30,000 L/day
7	phc thalanadu	0	IMAGE 1.5 kg per day	1.5 kg per day	Septic Tank 500 L/day
8	F H C Pallipuram	0	IMAGE 1.5 kg per day	1.5 kg per day	Septic Tank 500 L/day
9	FHC CHERANALLOOR	0	IMAGE 1.5 kg per day	1.5 kg per day	Septic Tank 500 L/day
10	CHC Pampakuda	16	IMAGE 7.5 kg per day	15 kg per day	Septic Tank 2000 L/day
11	PRIMARY HEALTH CENTRE VELOM	0	IMAGE 1.0 kg per day	1.5 kg per day	Septic Tank 500 L/day

12	Taluk Hospitral Kattappana	30	IMAGE 12 kg per day	25 kg per day	Septic Tank 7000 L/day
13	PHC MYLAPRA	0	IMAGE 1.0 kg per day	1.5 kg per day	Septic Tank 500 L/day
14	PHC KOTTATHARA	0	No IMAGE Deep burial	1.5 kg per day	Septic Tank 500 L/day
15	PRIMARY HEALTH CENTRE, THALAVOOR	0	IMAGE 1.5 kg per day	1.5 kg per day	Septic Tank 500 L/day
16	PHC Kottappuram, Palakkad dt	0	No IMAGE Deep burial	1.5 kg per day	Septic Tank 500 L/day
17	FHC KUMARAMANGALM	2	IMAGE 1.5 kg per day	1.5 kg per day	Septic Tank 500 L/day
18	CHC VANDIPERIYAR	24	IMAGE 8 kg per day	15 kg per day	Septic Tank 2000 L/day
19	PRIMARY HEALTH CENTRE EDATHALA	0	No IMAGE Deep burial	1.5 kg per day	Septic Tank 500 L/day
20	PHC IRIMBLIYAM	0	IMAGE 1.5 kg per day	1.5 kg per day	Septic Tank 500 L/day
21	CHC UPPUTHARA	30	IMAGE 9 kg per day	15 kg per day	Septic Tank 7000 L/day
22	PHC. THONOORKARA	0	No IMAGE Deep burial	1.0 kg per day	Septic Tank 500 L/day
23	Govt. Medical College, Thiruvananthapuram	2124	IMAGE 3500 kg	3500 kg waste per day Biogas plants- 1000kg/day Incinerator- 100kg/hour	45,000 litre Sewer line present
24	FAMILY HEALTH CENTRE KAKKODI	0	IMAGE 1.5 kg per day	1.0 kg per day	Septic Tank 500 L/day

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25	PRIMARY HEALTH CENTRE, MULAVUKAD	0	No IMAGE Deep burial	1.0 kg per day	Septic Tank 500 L/day
26	CHC PAIKA	36	No IMAGE Incinerator 6 kg per day	30kg per day	Septic Tank 8000 L/day
27	PHC CHOONDAL	0	No IMAGE Deep burial	1.0 kg per day	Septic Tank 500 L/day
28	Phc velookara	0	No IMAGE Deep burial	1.0 kg per day	Septic Tank 500 L/day
29	FAMILY HEALTH CENTRE, VAZHAKULAM	0	IMAGE 3 kg per day	3 kg per day	Septic Tank 500 L/day
30	PHC Thrikkakara	0	No IMAGE Deep burial	1.0 kg per day	Septic Tank 500 L/day
31	FHC KARIMANNOOR	25	IMAGE 9 kg per day	15 kg per day	Septic Tank 7000 L/day
32	Phc Senapathy	0	IMAGE 1.5 kg per day	1.0 kg per day	Septic Tank 500 L/day
33	chc ollur	18	No IMAGE Deep burial	15 kg per day	Septic Tank 2500 L/day
34	FHC Vilvattom	0	IMAGE 1.5 kg per day	1.0 kg per day	Septic Tank 500 L/day
35	PHC PALLIKATHODU	0	No IMAGE Deep burial	1.0 kg per day	Septic Tank 500 L/day

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36	Bphc Pamboor	0	IMAGE 1.5 kg per day	1.0 kg per day	Septic Tank 500 L/day
37	TALUK HEAD QUARTERS HOSPITAL FORTKOCHI	245	IMAGE 110 kg per day	200 kg per day	Septic Tank 50,000 L/day
38	PRIMARY HEALTH CENTRE, KOIPURAM	0	IMAGE 1.5 kg per day	1.0 kg per day	Septic Tank 500 L/day
39	GOVT.T.D.MEDICAL COLLEGE HOSPITAL VANDANAM,ALAPPUZHA	1051	IMAGE 700 kg per day	950 kg per day	STP 1.5MLD
40	PRIMARY HEALTH CENTRE THATTAKUZHA	0	IMAGE 1.5 kg per day	1.0 kg per day	Septic Tank 500 L/day
41	phc madakkathara	0	No IMAGE Deep burial	1.0 kg per day	Septic Tank 500 L/day
42	CHC AZHIKODE	22	IMAGE 10 kg per day	18 kg per day	Septic Tank 3500 L/day
43	W&C Hospital, Mattanchery	132	IMAGE 80 kg per day	90 kg per day	Septic Tank 30,000 L/day
44	Phc marangattupilly	26	IMAGE 10 kg per day	18 kg per day	Septic Tank 3800 L/day
45	KMCHC ETTUMANOOR	24	IMAGE 10 kg per day	18 kg per day	Septic Tank 3500 L/day
46	TALUK HEAD QUARTERS HOSPITAL HARIPAD	175	IMAGE 100 kg per day	180 kg per day	Septic Tank 35,000 L/day
47	PRIMARY HEALTH CENTRE KUDAYATHOOR	0	IMAGE 1.5 kg per day	1.0 kg per day	Septic Tank 500 L/day
48	phc avanoor	0	No IMAGE Deep burial	1.0 kg per day	Septic Tank 500 L/day

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49	CHC RAJAKKAD	0	IMAGE 1.5 kg per day	1.0 kg per day	Septic Tank 500 L/day
50	FHC CHELLANAM	0	No IMAGE Deep burial	1.0 kg per day	Septic Tank 500 L/day
51	PHC P.VEMBALLUR	10	IMAGE 7 kg per day	12 kg per day	Septic Tank 2000 L/day
52	COMMUNITY HEALTH CENTRE, THOLUR	10	IMAGE 7 kg per day	12 kg per day	Septic Tank 2000 L/day
53	PHC PARATHANAM	0	No IMAGE Deep burial	1 kg per day	Septic Tank 500 L/day
54	Phc narkilakad	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500 L/day
55	FHC VORKADY	1	IMAGE 1.5 kg per day	2 kg per day	Septic Tank 2000 L/day
56	phc poomala	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500 L/day
57	CHC VADANMEDU	44	No IMAGE Deep burial 1.5 kg per day	1 kg per day	Septic Tank 500 L/day
58	PHC ONAMTHURUTHU	0	No IMAGE Deep burial 1.5 kg per day	1 kg per day	Septic Tank 500 L/day
59	FHC ELAMPALLOOR	4	IMAGE 2 kg per day	2 kg per day	Septic Tank 1000 L/day
60	FHC Poomangalam	0	No IMAGE Deep burial	1 kg per day	Septic Tank 500 L/day

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			1.5 kg per day		
61	PHC KALLAR VATTIYAR	0	No IMAGE Deep burial 1.5 kg per day	1 kg per day	Septic Tank 500 L/day
62	PHC THENKARA	0	IMAGE 1.5 kg per day	1.5 kg per day	Septic Tank 500 L/day
63	TALUK HEAD QUARTERS HOSPITAL PAMPADY	125	IMAGE 50 kg per day	75 kg per day Incinerator	Septic Tank 500 L/day
64	PHC AYMANAM	0	No IMAGE Deep burial 1.5 kg per day	1 kg per day	Septic Tank 500 L/day
65	PHC PARATHODU	0	No IMAGE Deep burial 1.5 kg per day	1 kg per day	Septic Tank 500 L/day
66	PHC ELANJI	40	No IMAGE Deep burial 15 kg per day	20 kg per day	Septic Tank 800 L/day
67	FHC Panachikkad	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500 L/day
68	FHC Thirumarady	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500 L/day
69	CHC THALAYOLAPARAMBU	30	No IMAGE Deep burial 15 kg per day	20 kg per day	Septic Tank 5000 L/day

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70	chc kumarakom	50	IMAGE 18 kg per day	25 kg per day	Septic Tank 8000 L/day
71	PRIMARY HEALTH CENTRE KOLATHUR	0	No IMAGE Deep burial 1 kg per day	2 kg per day	Septic Tank 500 L/day
72	PRIMARY HEALTH CENTRE AZHEEKAL	0	IMAGE 1.5 kg per day	2 kg per day	Connected to sewer line
73	PHC Kandakkadavu	0	No IMAGE Deep burial 1 kg per day	2 kg per day	Septic Tank 500 L/day
74	Primary health centre Kattippara	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500 L/day
75	CHC KOOTTIKAL	32	No IMAGE Deep burial 18 kg per day	25 kg per day	Septic Tank 8000 L/day
76	TALUK HOSPITAL WANDOOD	42	IMAGE 15 kg per day	9 kg per day	Septic Tank 10000 L/day
77	P.H.C.Narippatta	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500 L/day
78	chc mayyanad	70	IMAGE 30 kg per day	29 kg per day Biogas Incinerator	Septic Tank 20000 L/day
79	Taluk Head quarters Hospital, PERUMBAVOOR	210	IMAGE 120 kg per day	180 kg per day	Septic Tank 30000 L/day
80	P.H.C.Madavana	18	IMAGE 10 kg per day	18 kg per day	Septic Tank 5000 L/day
81	Primary Health Centre Thondernad	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500 L/day

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82	CHC MALAYIDAMTHURUTH	0	No IMAGE Deep burial 1 kg per day	1.5 kg per day Incinerator	Septic Tank 500 L/day
83	TALUK HEAD QUARTERS HOSPITAL CHALAKUDY	144	IMAGE 58 kg per day	70 kg per day Biogas plant	25000 L
84	PHC Kuruppanthara	0	No IMAGE Deep burial 1 kg per day	1.5 kg per day	Septic Tank 500 L/day
85	PRIMARY HEALTH CENTRE VELLARIKUND	12	IMAGE 10 kg per day	18 kg per day	Septic Tank 2000 L/day
86	F H C OMASSERY	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500 L/day
87	FHC THALIKULAM	5	No IMAGE Deep burial 1 kg per day	2 kg per day r	Septic Tank 700 L/day
88	CHC OMANUR	24	IMAGE 10 kg per day	18 kg per day	Septic Tank 5000 L/day
89	PHC Kaduthuruthy	0	No IMAGE Deep burial 1 kg per day	1 kg per day	Septic Tank 600 L/day
90	chc.ambalavayal	32	IMAGE 18 kg per day	20 kg per day	Septic Tank 8000 L/day
91	GENERAL HOSPITAL IRINJALAKUDA	216	IMAGE 116 kg per day	200 kg per day Incinerator	6000L
92	Govt. Medical College Kottayam	1804	IMAGE 800 kg per day	500 kg per day Biogas plant Incinerator	STP 3.2 MLD

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93	THQH CHIRAYINKEEZH	243	IMAGE 100 kg per day	100 kg per day	Septic Tank 50,000L
94	PHC KALLARA	0	No IMAGE Deep burial 1 kg per day	1.5 kg per day	Septic Tank 500 L/day
95	PHC NOORANAD	0	IMAGE 1.5 kg per day	1.5 kg per day	Septic Tank 500 L/day
96	Taluk Head Quarters hospital Kodungallur	176	IMAGE 70 kg per day	1.5 kg per day Incinerator	Septic tank 30,000 L
97	GENERAL HOSPITAL, PALA	341	IMAGE 110 kg per day	150 kg per day Compost	STP 30 KLD
98	Fhc poothady	24	IMAGE 10 kg per day	15 kg per day	Septic tank 30,000 L
99	phc.cheeral	10	No IMAGE Deep burial 1.5 kg per day	1.5 kg per day	Septic Tank 500 L/day
100	PHC KEEZHMAD	14	IMAGE 5 kg per day	15 kg per day	Septic tank 2,000 L
101	GOVT TALUK HOSPITAL THAMARASSERY	64	IMAGE 10 kg per day	25 kg per day	STP 100 KLD
102	GOVT.T.D.MEDICAL COLLEGE HOSPITAL	1051	IMAGE 250 kg per day	450 kg per day	STP 1.5 MLD
103	Taluk Hospital Peringome	24	IMAGE 11 kg per day	20 kg per day	2000L
104	PHC Panjal	0	IMAGE 1.5 kg per day	1.5 kg per day	Septic Tank 500 L/day
105	Govt. Victoria Hospital, Kollam	250	IMAGE 110 kg per day	175 kg per day	Septic Tank 50,000L/day

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106	General Hospital Ernakulam	783	IMAGE 235 kg per day	175 kg per day	STP 30 KLD
107	Phc karikkattoor	0	No IMAGE Deep burial 1 kg per day	1 kg per day	Septic Tank 600 L/day
108	COMMUNITY HEALTH CENTRE, PULPALLY	26	IMAGE 11 kg per day	20 kg per day	2000L
109	Taluk Head Quarters Hospital Punalur	144	IMAGE 75 kg per day	90 kg per day	STP 70 KLD
110	Phc vizhikathodu	0	No IMAGE Deep burial 1 kg per day	1 kg per day	Septic Tank 500 L/day
111	COMMUNITY HEALTH CENTRE MARAYOOR	24	IMAGE 11 kg per day	20 kg per day	4000L
112	Sree Avittom Thirunna Hospital	1173	IMAGE 520 kg per day	700 kg per day Biogas plant Incinerator	300000
113	PHC PERUVEMBA	0	No IMAGE Deep burial 1 kg per day	1 kg per day	Septic Tank 500 L/day
114	FHC CHERUTHANA	24	IMAGE 11 kg per day	20 kg per day	5000L
115	GOVERNMENT MEDICAL COLLEGE HOSPITAL, MANJERI	516	IMAGE 200 kg per day	350 kg per day Biogas plant Incinerator	STP 800 KLD
116	General Hospital KOTTAYAM	374	IMAGE 180 kg per day	200 kg per day	Septic Tank 50,000 L/day

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117	FHC kanjikuzhy	0	IMAGE 1.5 kg per day	1.5 kg per day	Septic Tank 500 L/day
118	FAMILY HEALTH CENTRE NOOLPUZHA	10	IMAGE 3 kg per day	20 kg per day	Septic Tank 5000L
119	primary health centre cheppad	0	IMAGE 1.5 kg per day	20 kg per day	Septic Tank 5000L
120	PHC POONJAR	32	IMAGE Deep burial 12 kg per day	20 kg per day	Septic Tank 9,000L
121	PHC Thrikovilvattom	0	IMAGE 1.5 kg per day	20 kg per day	Septic Tank 5000L
122	FHC KONNATHADY	0	No IMAGE 1.5 kg per day	20 kg per day	Septic Tank 5000L
123	FHC VATTAVADA	2	No IMAGE Deep burial 1 kg per day	5 kg per day	Septic Tank 1,000L
124	PHC,AYAVANA	0	No IMAGE Deep burial 1 kg per day	1 kg per day	Septic Tank 500L
125	PRIMARY HEALTH CENTRE THAIKKAD, THRISSUR	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
126	PHC rajakumari	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
127	PHC Keezhallur	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
128	PHC KUNDUTHODE	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L

129	PRIMARY HEALTH CENTRE METHALA	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
130	CHC Chalissery	22	IMAGE 10 kg per day	15 kg per day	Septic Tank 3000L
131	districthospitalpalakkad	544	IMAGE 250 kg per day	300 kg per day	STP 270 kiloltr per day
132	PHC PURAMERY	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
133	phc chorode	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
134	FHC Erattupetta	24	No IMAGE Deep burial 5kg per day	10 kg per day	Septic Tank 2500L
135	Fhc kumily	24	IMAGE 1.5 kg per day	10 kg per day	Septic Tank 500L
136	CHC EDAYAZHAM	24	IMAGE 12 kg per day	10 kg per day	Septic Tank 500L
137	Taluk Hospital Nadapuram	110	IMAGE 50 kg per day	100 kg per day	Septic Tank 30,00L
138	PHC PALISSERY	0	No IMAGE Deep burial 5kg per day	10 kg per day	Septic Tank 500L
139	CHC Melady	35	IMAGE 15 kg per day	10 kg per day	Septic Tank 500L
140	F H C Kooroppada	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 1000L

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141	Phc chethalayam	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
142	Family Health Centre Madappally	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
143	DISTRICT HOSPITAL WADAKKANCHERY	117	IMAGE 60 kg per day	100 kg per day	STP 112 KLD
144	PHC pakkom	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
145	DISTRICT HOSPITAL VATAKARA	210	IMAGE 70 kg per day	150 kg per day	Septic Tank 50,000L
146	PHC VALLATHOL NAGAR	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
147	CHC RAMAPURAM	49	IMAGE 10 kg per day	20 kg per day	Septic Tank 10,000L
148	PHC ERAMANGALAM	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
149	PHC MOKERI	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
150	chc manjeswar	32	IMAGE 10 kg per day	20 kg per day	Septic Tank 8,000L

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151	Chc erumely	31	IMAGE 10 kg per day	20 kg per day	Septic Tank 8,000L
152	phc erumely	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
153	Taluk Hospital Mangalpady	24	IMAGE 11 kg per day	20 kg per day	5000L
154	FHC KARUMALLOOR	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
155	General Hospital, Thrissur	240	IMAGE 150 kg per day	180 kg per day	60,000L
156	PHC UDAYANAPURAM	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
157	PHC TV PURAM	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
158	phc meenadom	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
159	PHC THRIKKUR	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
160	PHC Puthuppally	0	No IMAGE	1 kg per day	Septic Tank 500L

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			Deep burial 0.5 kg per day		
161	PHC VELLAMUNDA	10	IMAGE 7 kg per day	5 kg per day	2000L
162	F.H.C ELANAD	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
163	GENERAL HOSPITAL TRIVANDRUM	747	IMAGE 100 kg per day	200 kg per day Biogas plant	Sewer line
164	CHC PAPPINISSERY	56	IMAGE 10 kg per day	12 kg per day	Septic Tank 10,000L
165	PRIMARY HEALTH CENTRE, KOTTAMKARA	1	IMAGE 1.5 kg per day	2 kg per day	Septic Tank 500L
166	PRIMARY HEALTH CENTRE PARASSINIKADAVU	1	IMAGE 1.5 kg per day	2 kg per day	Septic Tank 500L
167	phcpampuruthy	0	IMAGE 1.5 kg per day	2 kg per day	Septic Tank 500L
168	phc.varantharappilly	0	IMAGE 1.5 kg per day	2 kg per day	Septic Tank 500L
169	PHC KAKKAYAM	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
170	Taluk head quarters hospital , chavakkad	140	IMAGE 75kg per day	100 kg per day Biogas plant	STP 25 KLD
171	PHC Vallachira	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L

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172	PHC Peralassery	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
173	PHC Kodakara	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
174	Taluk Head quarters Hospital CHERTHALA	251	IMAGE 112 kg per day	200 kg per day	STP 50 KLD
175	PHC Madikai	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 1500L
176	CHC Pulluvila	25	IMAGE 11 kg per day	10 kg per day	Septic Tank 3200L
177	Community Health Centre, Palathara	12	IMAGE 11 kg per day	10 kg per day	Septic Tank 2200L
178	COMMUNITY HEALTH CENTRE EDAMARUKU	24	No IMAGE Deep burial 5 kg per day	10 kg per day	Septic Tank 3500L
179	PHC Devikulangara	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
180	PHC ERAMALLIKKARA	1	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
181	Taluk hospital Thuravoor	24	IMAGE 11 kg per day	10 kg per day	Septic Tank 3500L
182	COMMUNITY HEALTH CENTRE VADAKKEKAD	48	IMAGE 18 kg per day	10 kg per day	Septic Tank 3200L

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183	PHC KANTHALLOOR	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
184	Govt. Women & Children Hospital, Palakkad	250	No IMAGE Deep burial 150 kg per day	200 kg per day	STP 200 KLD
185	PHC Maravanthuruthu	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
186	PHC KANTHALLOOR	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
187	Regional Institute of Ophthalmology, Thiruvanantha puram	250	IMAGE 100 kg per day	200 kg per day	Sewer line 50,000 L
188	PRIMARY HEALTH CENTER KOTTAPPADY	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
189	PRIMARY HEALTH CENTRE	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
190	PHC Kurukkanmoola	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
191	FHC NENMANIKKARA	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
192	community Health Center Orkkattery	12	IMAGE 5 kg per day	8 kg per day	Septic Tank 2500L
193	PHC Maravanthuruthu	0	No IMAGE Deep burial	1 kg per day	Septic Tank 500L

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			0.5 kg per day		
194	Rural health centre Vakkom	8	IMAGE 5 kg per day	8 kg per day	Septic Tank 2500L
195	CHC MEENANGADI	26	IMAGE 7 kg per day	10 kg per day	Septic Tank 6500L
196	PHC PURAKKAD	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
197	FAMILY HEALTH CENTRE OTHERA	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
198	PHC BISONVALLEY	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
199	PRIMARY HEALTH CENTER KONDAZHY	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
200	PHC Thrickodithsnam	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
201	CHC Elinjipra	18	IMAGE 7 kg per day	10 kg per day	Septic Tank 6500L
202	FHC Arattupuzha	10	IMAGE 7 kg per day	10 kg per day	Septic Tank 8500L
203	FAMILY HEALTH CENTRE MUNDUR	0	IMAGE 1.5 kg per day	4 kg per day	Septic Tank 8500L
204	Community Health Centre Ulliyeri	16	IMAGE 7 kg per day	10 kg per day	Septic Tank 8500L
205	P.H.C KALLARA	0	No IMAGE	1 kg per day	Septic Tank 500L

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			Deep burial 0.5 kg per day		
206	GENERAL HOSPITAL CHENGANACHERRY	207	IMAGE 78 kg per day	100 kg per day	Septic Tank 50,000L
207	PHC PARASSINIKADAVU	1	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
208	Phc karalam	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
209	PHC POOKKODE	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
210	Community Health Centre POOVAR	45	IMAGE 15 kg per day	10 kg per day	Septic Tank 10,500L
211	Primary health centre Kakkad thrissur	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
212	P H C VETILAPPARA	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
213	P.H.C. Arimbur	24	IMAGE 15 kg per day	18 kg per day	Septic Tank 9500L
214	PHC Nalukettu	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
215	CHC Kadappuram	18	IMAGE 11 kg per day	18 kg per day	Septic Tank 9500L
216	CHC Ullanadu	24	IMAGE 10 kg per day	20 kg per day	Septic Tank 10,500L

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217	Primary Health Centre, Mudakkal	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
218	phc pizhala	2	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 600L
219	PHC ALAGAPPANAGAR	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
220	CHC Mattathur	34	IMAGE 10 kg per day	20 kg per day	Septic Tank 9,500L
221	PHC Thazhava	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
222	PHC PUTHUVYPPU	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
223	CHC THRIKKADAVOOR	16	IMAGE 5 kg per day	8 kg per day	Septic Tank 1500L
224	PHC UZHAVOOR	150	IMAGE 80 kg per day	100 kg per day Biogas plant	STP
225	phc ezhukone pavithreswaram	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
226	PHC PATTIKKAD	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
227	PHC Mupliyam	0	No IMAGE Deep burial	1 kg per day	Septic Tank 500L

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			0.5 kg per day		
228	PHC KUTHAMPULLY	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
229	PHC Mutholy	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
230	Government Tribal Specialty Hospital Kottathara	100	IMAGE 65 kg per day	85 kg per day	STP 20 KLD
231	Phc west kallada	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
232	Primary Health Centre Ezhukone	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
233	FHC Kozhuvanal	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
234	PHC Karoor	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
235	FHC PATTYAM	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
236	PHC Kadanad	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
237	FHC Meenachil	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L

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238	Phc Kadungalloor	1	IMAGE 1.5 kg per day	1.5 kg per day	Septic Tank 500L
239	Phc thekkumkara	0	IMAGE 1.5 kg per day	1.5 kg per day	Septic Tank 1000L
240	FHC VATTAMKULAM	0	IMAGE 1.5 kg per day	1.5 kg per day	Septic Tank 500L
241	FAMILY HEALTH CENTRE BRAHMAMANGALAM	6	No IMAGE Deep burial 1.5 kg per day	1.5 kg per day	Septic Tank 2500L
242	Primary Health Centre Koodal	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
243	P H C EDAVETTY	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
244	P H C KANNAMANGALAM	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
245	cHC Velinalloor	34	IMAGE 5 kg per day	8 kg per day	Septic Tank 8500L
246	PUNNAYUR FHC	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
247	Primary Health Centre	1	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
248	CHC MARANCHERY	16	IMAGE 5 kg per day	8 kg per day	Septic Tank 6500L
249	PHC.KARULAI	10	IMAGE 25 kg per day	8 kg per day	Septic Tank 6500L
250	PHC (Fisheries Dispensary) Koottai	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L

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251	PRIMARY HEALTH CENTRE KODUR	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
252	GOVT.FISHERIES HOSPITAL PALLANA	20	IMAGE 5 kg per day	8 kg per day	Septic Tank 6500L
253	PHC NEDUVATHOOR	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
254	P H C KANNAMANGALAM	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
255	PHC Nadathara	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
256	PHC THELLIYOOR	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
257	Family Health Centre Karindalam	4	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 3500L
258	PHC EZHUVATHIRUTHY	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
259	Community Health Centre Periyē	12	IMAGE 5 kg per day	10kg per day	Septic Tank 3500L
260	PHC OLLUKKARA	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
261	CHC VETOM	22	IMAGE 5 kg per day	10kg per day	Septic Tank 8500L

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262	PHC VANIYAMPARA	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
263	FHC KAYYUR	6	IMAGE 2 kg per day	1kg per day	Septic Tank 5500L
264	PHC OLAT	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
265	CHC Valapad	64	IMAGE 20 kg per day	20kg per day	Septic Tank 10,500L
266	District Hospital Nedumangad	225	IMAGE 100 kg per day	200kg per day	Septic Tank 50,000L
267	General Hospital alappuzha	400	IMAGE 100 kg per day	200kg per day Biogas plant	Septic Tank 60,000L
268	FHC Pallichal	3	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
269	thaluk hospital peringome	24	IMAGE 1.5 kg per day	5 kg per day	Septic Tank 5000L
270	Phc karuvatts	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
271	PHC Adoor	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
272	TALUK HEAD QUARTERS HOSPITAL, MALLAPPALLY	128	IMAGE 50 kg per day	100 kg per day	STP 50KLD
273	FAMILY HEALTH CENTRE MANALUR	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L

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274	District Hospital Kanhangad	364	IMAGE 150 kg per day	150 kg per day	STP 100KLD
275	Taluk Head quarters Hospital, kuravilangadu	53	IMAGE 5 kg per day	21 kg per day	Septic Tank 10 000L
276	CHC MULIYAR	12	IMAGE 5 kg per day	5 kg per day	Septic Tank 5000L
277	GOVT.WOMEN& CHILDREN HOSPITAL KOZHIKODE	206	IMAGE 70 kg per day	142 kg per day	Septic Tank 10000L
278	PHC PURAMATTOM	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
279	Taluk Hospital Varkala	64	IMAGE 12 kg per day	21 kg per day	Septic Tank 15,000L
280	PUrimary Health Centre KOKKATHOD	2	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
281	PHC THOTTAPUZHASERY	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
282	PHC EZHAMKULAM	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
283	Primary Health Centre Erathu	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
284	Phc parappukkara	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
285	CHC kattoor	32	No IMAGE	1 kg per day	Septic Tank 10500L

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			Deep burial 0.5 kg per day		
286	Phc porathisseri	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
287	Primary Health Center Mancodu Pathanapuram	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
288	CHC BADIADKA	30	IMAGE 5 kg per day	15 kg per day	Septic Tank 3000L
289	PHC MALLAPUZHASSERRY	1	IMAGE 1.5 kg per day	0.5 kg per day	Septic Tank 1000L
290	DISTRICT HOSPITAL MAVELIKARA	347	IMAGE 50kg per day	250 kg per day Biogas plant	Septic Tank 50,00L
291	PHC BELLUR	0	No IMAGE Deep burial 0.5 kg per day	1 kg per day	Septic Tank 500L
292	PHC THODIYOOR	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
293	Community Health Centre Kesavapuram	54	IMAGE 15 kg per day	25 kg per day	Septic Tank 12,000L
294	PHC Pooyappally	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
295	Family Health Centre Pallickal	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L
296	Govt Mental Health Centre, Kozhikode	474	IMAGE 150 kg per day	250 kg per day Biogas plant	Septic Tank 50,000L

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297	CHC Valayam	18	IMAGE 3 kg per day	10kg per day Biogas plant	Septic Tank 5,000L
298	FHC, SN Puram	0	IMAGE 1.5 kg per day	1 kg per day	Septic Tank 500L

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CONSOLIDATED STATUS CUM ACTION TAKEN REPORT**1. Status of implementation of Solid Waste Management Rules, 2016****1.1 General**

In Kerala, efforts have been taken to implement the Solid Waste Management Rules, 2016 in the State. There are 6 Corporations, 87 Municipalities and 941 GramaPanchayaths. The Board issued repeated directions to all local bodies for the compliance of the Solid Waste Management Rules, 2016.

1.2 State Level Advisory Committee on Waste Management with Chief Secretary as Chairman

Government of Kerala constituted a State Level Advisory Committee on Waste Management chaired by the Chief Secretary. It has conducted 24 meetings for monitoring solid waste management on monthly basis. The last meeting was held on 23-3-2019.

1.3 Compliance of the Rules**1.3.1 Submission of annual report(Rule 24)**

Annual report was submitted to the Central Pollution Control Board on 26-9-2018

(Rule 24)

1.3.2 State Level Advisory Body(SLAB)(Rule 23)

SLAB was constituted in the State vide order G.O. (RT).

No.140/2018/LSGD dtd 16/01/2018 (copy attached). Meetings of the SLAB conducted on 23.03.2018 (minutes attached)

1.3.3 Compliance of Rule 22

The detailed action taken report furnished by the Local Self Government Department is submitted herewith.

Sl. No	Activity	Action taken												
1	Identification of suitable sites for setting up solid waste processing facilities	Government identified the following sites in all census towns in Kerala for setting up solid waste processing facilities. <table border="1"> <thead> <tr> <th>Sl. No</th> <th>Corporation/ Municipality</th> <th>Identified site</th> <th>Area in acre</th> <th>Status</th> <th>Completion date</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Kollam</td> <td>Kureepuzha (Govt land)</td> <td>7.05</td> <td>Floated Global Tender for the setting</td> <td>Two years from the date of obtaining environme</td> </tr> </tbody> </table>	Sl. No	Corporation/ Municipality	Identified site	Area in acre	Status	Completion date	1.	Kollam	Kureepuzha (Govt land)	7.05	Floated Global Tender for the setting	Two years from the date of obtaining environme
Sl. No	Corporation/ Municipality	Identified site	Area in acre	Status	Completion date									
1.	Kollam	Kureepuzha (Govt land)	7.05	Floated Global Tender for the setting	Two years from the date of obtaining environme									

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				up of Waste to Energy Plant	ntal clearance.
2.	Ernakulam	Brahma puram (Govt land)	20	Work awarded to M/s G.J Ecco Power Pvt Ltd.	Two years from the date of obtaining environme ntal clearance.
3.	Palakkad	Kanjiko de (Land taken over form Kerala State Electric ity Borad Ltd. in advance possessi on)	15	Floated Global Tender for the setting up of Waste to Energy Plant	Two years from the date of obtaining environme ntal clearance.
4.	Kozhikode	Njaliya nparam bu (Govt land)	12.6 7	Tender process complete d. Decided to award the work to M/s Zonta Infratech Pvt Ltd.	Two years from the date of obtaining environme ntal clearance.
5.	Kannur	Chelora (Govt. Land)	9.7	Floated Global Tender for the setting up of Waste to Energy Plant	Two years from the date of obtaining environme ntal clearance.
6.	Wayanad	Sulthan Bathery	0.5	Construc tion of	Expected to be

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		(Govt. Land)		plant is going on.	commissioned by August 2019
7.	Thiruvananthapuram	Peringamala (Govt. Land)	15	Stakeholder meetings have been conducted. Further action is being taken	Two years from the date of obtaining environmental clearance.
8	Thrissur	Laloor (Govt. Land)	15	Stakeholder meetings have been conducted. Further action to tender the work will be initiated soon	Two years from the date of obtaining environmental clearance.
9	Malappuram	Panakkad (Land in possession with Kerala State Industrial Development Corporation)	10	Further action is being taken	Two years from the date of obtaining environmental clearance.
10	Idukki	Munnar (Land handed over by M/s Kannan Devan Hills Plantati	2	Decided to award the work to M/s AG Dauters Waste Processing Pvt.	Two years from the date of obtaining environmental clearance.

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				ons Pvt Ltd)		Ltd.	
	<p>Identification of suitable sites for setting up common regional sanitary landfill facilities for suitable clusters of local authorities under 0.5 million population and for setting up common regional sanitary landfill facilities or stand alone sanitary landfill facilities by all local authorities having a population of 0.5 million or more.</p>	<p>Six Regional Sanitary landfill sites identified by Suchitwa Mission based on the criteria for locating landfills, using satellite imagery.</p> <p>For the Palakkad, detailed study was conducted to establish a pilot sanitary landfill but the Committee appointed by the District Collector found the land to be unsuitable.</p> <p>At Thiruvananthapuram and Kollam, work was started at Vilappilsala and Kureepuzhabut had to be abandoned due to public protest</p>					
3	<p>Procurement of suitable sites for setting up solid waste processing facility and sanitary landfill facilities</p>	<p>Government have identified appropriate land for establishing centralized Waste to Energy Plants in Kannur, Kozhikode, Malappuram, Palakkad, Thrissur, Kollam and Thiruvananthapuram and permitted the handing over of the land for the purpose vide G. O (Ms) no.82/2018/LSGD dated 11/06/18.</p> <p>These projects are planned to establish on Design, Build, Finance, Operate and Transfer (DBFOT) basis through Public Private Partnership (PPP) mode. In addition, suitable land has been identified and handed over for the purpose of establishing Centralized Waste Management Plant in Ernakulam, Idukki and Wayanad Districts.</p> <p>Even though suitable land had been identified to establish sanitary landfill in Thiruvananthapuram and Kollam City Corporations, respectively at Vilappilsala and Kureepuzha, the same had to be abandoned due to public protest and judicial intervention.</p> <p>Perumbavoor Municipality purchased 158 cents of land in Corporation Ward 26 at Parappuram</p>					
4	<p>Enforcing waste generators to practice segregation of bio degradable, recyclable, combustible, sanitary waste domestic hazardous and inert</p>	<p>1. Overflow waste management system is adopted in the State; thereby order of the priority is to treat the biodegradable waste at the Source itself.</p> <p>2. About 4 lakh households, 30,000 institutions and 2000 community locations have facilities for treating biodegradable waste and thus practice segregation of waste at source</p>					

	solid wastes at source	<p>3. Segregation is also complied with by 62 Urban Local Governments and 484 Grama Panchayats as door-to-door collection of segregated non-biodegradable waste is operational through Haritha KarmaSena.</p> <p>4. The details submitted by the LSGD are enclosed. The summary is given below: <u>Urban local bodies</u> 4.1 79.6% of Urban local bodies have source level composting facilities for the processing of biodegradable waste at household, institutional and at community level. 4.2 82.8% of Urban local bodies have door to door collection of non-biodegradable waste 4.3 54% of Urban local bodies where captive waste management system is enforced for the bulk waste generator 4.4 66.7% of Urban local bodies have formed, trained and started functioning of Haritha Karma Sena 4.5 66.7% of Urban local bodies have Material Collection Facility is available 4.6 57% of local bodies have Resource Recovery Facility is available</p>		
5	Ensure door-to-door collection of segregated waste and its transportation in covered vehicles to processing or disposal facilities	5.0	Door-to-door collection system at present for biodegradable waste. D2D will be implemented in wards having decentralized organic waste composting facilities.	*
		5.1	82.8% of Urban local bodies have door to door collection of non-biodegradable waste	*
		5.2	Full D2D to be implemented on commissioning of WtE plants in all 7 census towns in Kerala	*
<p><i>*Haritha Karma Sena (HKS), an enterprise group formed through the State Poverty Eradication Mission (Kudumbasree). The enterprise group is designed to have two persons for each ward for door-to-door collection of non-biodegradable waste on a regular basis and help in managing the household-institutional-community systems for composting biodegradable waste.</i></p> <ul style="list-style-type: none"> <i>The user fee is fixed by the respective local government depending on the services rendered and based on the guidelines issued vide G.O(Rt)No.2420/2017/ LSGD dated 15.07.2017.</i> <i>In order to sustain the operation of the door-to-door collection system, Government provided a Viability</i> 				

		<p>Gap Fund (VGF) support initially for 6 months so as to make up the shortage of user fee collection in the initial stages such that each member of the group get atleast minimum wage decided by the government.</p> <ul style="list-style-type: none"> • The VGF support is extended for 6 more months at half the rate of that provided during the first six months in order to ensure that the HKS operation is sustainable in financial terms. In order to improve the sustainability of HKS, actions are also being taken to include more value-added household level services in the functioning of HKS. • The HKS is to be trained and their operation ensured through a technical support mechanism namely Haritha Sahaya Sthapanam (HSS), a Green Support Organization mostly drawn from non-governmental organizations having experience in waste management services. • There are 36 HSS deployed in the State at the ULB and Block Panchayat level. All the 941 Gram Panchayats (GP) have taken actions to form HKS. HKS is now functional in 484 GPs for door to door collection of segregated non-biodegradable waste.
6	<p>Ensure separate storage, collection and transportation of construction and demolition wastes</p>	<ul style="list-style-type: none"> • Direction has been given to Local Self Government Institutions to identify suitable sites for the storage of Construction & Demolishing Waste. • There is no treatment facility in the state for processing C&D waste at present. • All the projects that generate construction and demolition waste and that require environmental clearance are directed to store the C&D waste separately and reuse or recycle it during the construction phase. • Government proposes to establish a C&D waste management facility for which fund is earmarked under the budget provision for 2019-20. • It is proposed to establish the facility in collaboration with major stakeholders for management of construction and demolition waste such as building materials, debris, rubbles resulting from construction, re-modelling, repair and demolition of any civil structure of individual or organisation or authority. • Preliminary discussions have been held with Swachh Bharat Mission (Urban) in the Ministry of Housing and Urban Affairs, Govt. of India for technical support.
7	<p>Setting up solid waste processing facilities by all local bodies having 1</p>	<p>Government have accorded sanction for establishing Waste to Energy plants in the following 8 cites identified on cluster basis of local bodies having 1 Lakh or more</p>

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Lakh or more population	population					
	Sl. No	Corporation/ Municipality	Identified site	Area in acre	Status	Completion date
	1.	Kollam	Kureepuzha (Govt land)	7.05	Floated Global Tender for the setting up of Waste to Energy Plant	Two years from the date of obtaining environmental clearance.
	2.	Ernakulam	Brahmapuram (Govt land)	20	Work awarded to M/s G.J Ecco Power Pvt Ltd.	Two years from the date of obtaining environmental clearance.
	3.	Palakkad	Kanjikode (Land taken over from Kerala State Electricity Borad Ltd. in advance possession)	15	Floated Global Tender for the setting up of Waste to Energy Plant	Two years from the date of obtaining environmental clearance.
	4.	Kozhikode	Njaliyanpambu (Govt land)	12.67	Tender process completed. Decided to award the work to M/s Zonta Infratech Pvt Ltd.	Two years from the date of obtaining environmental clearance.
	5.	Kannur	Chelora (Govt. Land)	9.7	Floated Global Tender for the	Two years from the date of obtaining

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					setting up of Waste to Energy Plant	environmental clearance.	
		6.	Thiruvananthapuram	Peringamala (Govt. Land)	15	Stakeholder meetings have been conducted. Further action is being taken	Two years from the date of obtaining environmental clearance.
		7.	Thrissur	Laloor (Govt. Land)	15	Stakeholder meetings have been conducted. Further action to tender the work will be initiated soon	Two years from the date of obtaining environmental clearance.
		8.	Malappuram	Panakkad (Land in possession with Kerala State Industrial Development Corporation)	10	Further action is being taken	Two years from the date of obtaining environmental clearance.
8	Setting up solid waste processing facilities by local bodies and census towns below 100000 population	Local Body		Nature of Plant		Status/Time of completion	
		SulthanBathery Municipality in Wayanad District		5 TPD modern bio gas plant		Construction of plant is going on. Expected to be commissioned by August 2019.	

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		Munnar and Devikulam Grama Panchayat in Iduki District	Modern Waste to Energy Plant	Decided to award the work to M/s AG Dauters Waste Processing Pvt. Ltd. Expected to be completed within two years from April, 2019.
		Perinthalmanna Municipality.	Modern Waste to Energy bio gas plant of two tone/day capacity.	Work awarded to GPS Renewables, Bangalore. Expected to be completed within 12 months from April, 2019.
9	Setting up common or stand-alone sanitary landfills by or for all local bodies having 0.5 million or more population for the disposal of only such residual wastes from the processing facilities as well as untreatable inert wastes as permitted under the Rules	Even though suitable land had been identified to establish sanitary landfill in Urban Local Bodies having 0.5 million or more population such as Thiruvananthapuram and Kollam City Corporations, respectively at Vilappilsala and Kureppuzha, same had to be abandoned due to public protest and judicial intervention		
10	Setting up common or regional sanitary landfills by all local bodies and census towns under 0.5 million population for the disposal of permitted waste under the rules	<ul style="list-style-type: none"> • A study has been conducted with the support of the World Bank and it has been recommended that there is a requirement of 6 regional sanitary landfill facility in the state. • Based on the criteria for locating sanitary landfill sites, the study proposed 6 probable sites, one each for Kasaragod and Kannur District, Kozhikode and Wayanad district, Malappuram and Palakkad district, Thrissur and Ernakulam district, Kottayam, Idukki and Pathanamthitta district and Alappuzha, Kollam and Thiruvananthapuram districts. • Further, detailed study had been conducted in Palakkad district to establish a pilot sanitary landfill by a Committee appointed by the District Collector. • The findings of the Committee are not favorable and hence it has been requested to look for an alternate site. 		

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11	Bio-remediation or capping of old and abandoned dump sites	Sl. no	Census town	Site	Status	Completion date
		1	Thiruvananthapuram	Vilapilsala	Capped	
		2	Kollam	Kureepuzha	Tendering	Expected to be completed within 6 months
		3	Ernakulam	Brahmapuram	Commenced	Expected to be completed within 6 months
		4	Thrissur	Laloor	The cite is proposed for the setting up of Waste to Energy Plant.	
		5	Kozhikode	Njeliyamparam ab	Since the cite is proposed for the setting up of Waste to Energy Plant, capping of waste at the cite is not practicable. Action has been initiated to store the accumulated waste to another suitable place till commissioning of Waste to Energy	Expected to be completed within 6 months

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					Plant.	
		6	Kannur	Chelora	The cite is proposed for the setting up of Waste to Energy Plant.	

1.4 Compliance to Rule 11 (Secretary Urban Development)

- a) State level policy for the State was published and the action is taken on the basis of the policy
- b) State level strategy of solid waste management was developed.

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2. Status of implementation of Plastic Waste Management Rules, 2016

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2.1 Compliance of the Rules

2.1.1 Submission of annual report (Rule 24)

The Annual Report on Plastic Waste Management Rules 2017-18 was submitted to CPCB vide letter number PCB/HO/PLA/AR/20/2017-18 dated 30/11/2018 and the same was also uploaded in E-Samyojan.

2.1.2 State Level Monitoring Committee (Rule 23)–

State Level Monitoring Committee was constituted vide order G.O. (Rt). No.2732/2016/LSGD dtd 24/09/2016 (**copy attached**). The meeting of the State Level Monitoring Committee on Plastic Waste Management Rules conducted on 10/04/2018 (**minutes attached**).

2.1.3 Manufacturers of Plastic products

Kerala State Pollution Control Board issued registration to 1005 plastic units. The Board inspected the units and verified whether the thickness of carry bag is more than 50 microns and to verify the conditions of consent are complied.

2.1.4 Registered recycling units

There are 101 registered recycling units in the State. The list was made available to Local bodies, Suchitwa Mission, Clean Kerala Company. It is also available in the Board's website.

2.1.5 Registration to producers, brand owners

The Extended Producer Responsibility was brought to the notice of producers, and brand owners through several workshops. The agencies namely Milma, Kera etc., were also addressed in this regard. The matter is being followed up.

2.1.5 Technical Committee Report on Regulation of Single use plastic

The Government has constituted an Expert Committee vide Order No. G.O (Rt) No.134/2018/Envvt dated 12/12/2018 to list out the plastic products/items that need to be brought into the ambit of complete ban. The Committee submitted their report on 1-4-2019 before the Government.

The Committee recommended the introduction of a 'return-and-earn' scheme ("Return-Deposit-Refund" scheme) for carry-bags and bottles to prevent littering. The Committee recommended ban on plastic flags, plastic decorative festoons/ buntings, single use food plates, cups made of multi-laminated board / aseptic liquid paperboard, also known as 'Tetra pak' paperboard.

3. Status on compliance of Biomedical Waste Management Rules, 2016

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3.1 General

Kerala has numerous healthcare institutions (HCIs) such as Medical colleges, hospitals, speciality hospitals, clinics, clinical laboratories, bio-research Institute etc. The above stated HCIs were taken under the scope of the inventory. Health care facilities in the Government sector comprising primary and community health centres having only out patients facilities are counted as clinics. The veterinary hospitals, AYUSH are also brought to the purview of the Biomedical Waste Management Rules.

3.2 Status of health care institutions in Kerala

In Kerala, there are 9331 HCIs. Of which, 2011 are hospitals, 1335 are clinics, 3222 are clinical laboratories, and 2732 are dental institutions. Of the 9331 HCIs identified, 759 are in Government sector and 8572 in private sector. There are 2967 institutions with inpatient facilities with 118649 beds.

All others except clinical laboratories and dental institutions are considered as clinics. Thus this category includes nursing homes, dispensaries, primary health centres without inpatient facilities, sub centres under primary health centres etc.

There are 28 hospitals (2%) having bed strength of 500 beds and more. Of which 17 are in the private sector and 11 are in the Government sector. 108 hospitals (5%) are having bed strength between 200 and 499. 76 of them are in the private sector and 32 are in the Government sector. Majority of hospitals (79%) are having less than 50 beds and majority of them are in private sector.

3.3 Compliance of the Rules

3.3.2 Submission of annual report(Rule 24)

Annual report was submitted to the Central Pollution Control Board on 26-9-2018
(Rule 24) (Copy attached).

	Type*	No
1	Bedded hospitals and nursing homes	5280
2	Clinics and dispensaies	150
3	Animal houses	1
4	Pathological laboratories	882
5	Blood banks	14
6	Clinical establishments	955
7	Research institutions	0
8	AYUSH	216
	Total	9628

No of beds – 1,02,086

3.3.2 State Level Advisory Commiittee for Biomedical Waste Management

SLAC was constituted in the State vide vide order G.O. (Ms).
No.02/0/Envvt. dated 6-3-2010 dated 6-3-2010 and again re-constituted

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vide G.O. No. (Rt) No. 15/1/Envvt dated 24-10-2011 (copy attached). Meetings of the SLAC were conducted. District level committee as per the new rules is to be constituted.

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3.4 Category-wise biomedical waste generated in Kerala

In Kerala, 13771.4 tonne of biomedical wastes is generated annually. Of which 6364t are in the red category, 4705.8t are in the yellow category, 1613t in white category and 1088t in blue category. The wastes fall in red category means they are recyclable after treatment such as autoclaving. The maximum quantity is produced in Ernakulam district (4277 tonne/annum) followed by Thrissur(1669 tonne/annum), Kozhikode (1164 tonne/annum), Kottayam(50 tonne/annum), Thiruvananthapuram(1122 tonne/annum) and Malappuram(977 tonne/annum). The minimum quantity is produced in Wayaand (120 tonne/annum) and Idukki(137 tonne/annum).

In Kerala, the total quantity of biomedical wastes generated is 13771 tonne per annum of bio-medical waste. Of which, 11361 tonne per annum of bio-medical wastes is generated in hospitals. 82.5% of biomedical wastes are generated in hospitals. 3% of biomedical wastes are generated in clinics. 9.5% of biomedical wastes are generated in clinics. 2.2% of biomedical wastes are generated in clinics.

3.5 Common biomedical Waste treatment facility in the State (CBMWTF)

The common biomedical waste treatment facility is located at Kanjikode, Palakkad. It has a capacity of 37TPD. There are 5 incinerators, and 5 autoclaves in the plant. Around 13000 institutions are disposing the biomedical wastes into the common biomedical treatment facility.

The Government proposes to set-up Common Biomedical Waste Treatment Plants in

- Ambalamedu, Ernakulam,
- Kinalur, Kozhikode
- Unidentified site, Thiruvananthapuram

a) CBMWTF facility at Kinalur, Kozhikode

- Integrated Consent to Establish having valid upto 31-12-2016 was issued to Si. P. S. Deepthikumar 4-4-2014 for setting a Common Biomedical Waste Treatment Facility (Incinerator – 100kg/hr; autoclave -1000l; shredder of 100kg/hr) in the industrial estate of Kerala State Industrial Development Corporation (KSIDC) in Resurvey No. 95/1, Kinalu village, Koyilandy taluk, Kozhikode district

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and Consent was again renewed on 5-9-2017 for a term upto 31-12-2020.

- Environmental Clearance was issued on 26th June 2015 for CBMWTF with two numbers of incinerators 200 and 300kg/hr; two numbers of autoclave (2Nos) of 400kg/hr each and a shredder of 700kg/hr.
- As there was strong public agitation against this, several meetings were conducted at the level of District Collector and the level of Minister. In the meeting conducted by Hon'ble Excise Minister, there was suggestion for relocating the location CBWMTF to a location within the KSIDC Industrial estate which is far away from residential area. The Board was directed to identify a new location for Common Biomedical Treatment plant within the Kinalur Industrial Estate.
- Based on the direction received from office of the District Collector on 21-5-2018, inspection was conducted on 22-5-2018 by Tahasildar, Thamarassery Taluk, Assistant Manager, KSIDC and a new location was identified by KSIDC officials.
- The proposed new location is situated 1 km away from the previous approved location for which Integrated to Establish was issued. This land is being surveyed by KSIDC.
- The applicant is instructed to apply for consent Variation order for the new location and also to amend the Survey no in the EC.

b) CBMWTF facility by Kerala Enviro Infrastructure Limited, Ambalamedu, Ernakulam

- Consent was issued vide consent No. PCB/HO/EKM/ICE/08/204 dated 10-3-2014 to Kerala Enviro Infrastructure Limited for setting up CBMWTF in 3.5 acres of land within 50 acres of land owned by KEIL. The waste handling capacity for which consent issued was for 14-16TPD with two incinerators, two autoclaves and a shredder. It was renewed for a term upto 30-6-2019 vide Consent No. PCB/HO/EKM-II/ICE-R/02/2017 dated 5-10-2017.
- Public hearing was conducted on 7-11-2016 at District Collectorate, Ernakulam and there was strong public protest at that time and report was submitted to MoEF on 14-1-2016. Environment Clearance was issued in 2017.
- Loan facility from KSIDC/banks is being arranged and the project execution will start immediately on financial closure.

c) CBMWTF facility by Indian Medical Association at Peringamala, Thiruvananthapuram

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- Consent was issued vide consent No. PCB/HO/PLKD/ICO/2009 dated 4-4-2009 with validity upto 30-6-2012 for setting up CBWTDF to manage and handle biomedical wastes for an incinerator of 200kg/hour.
- Public hearing was conducted on 22-2-2017 at the Collectorate and then again conducted on 3-1-2018 at Peringamala Panchayath Hall. The minutes of the public hearing submitted to SEIAA. There is strong public protest against this project at Peringamala

3.6 Authorisation from the Board

- Health care institutions have obtained authorization from the Board.

3.7 Others

Sl No:	Action Points	Action taken
1.	Inventory of healthcare facilities	The Inventory of healthcare facilities for the year 2017 was submitted to CPCB vide letter No.PCB/HO/RULES/BMW-INVENTORY/2017/48/2017 dated 5.01.2019, a copy of which is enclosed
2.	Submission of Annual Reports to CPCB	The annual report for the period 2017 was submitted to CPCB vide Letter No.PCB/HO/BMW/EE-1/AR-2017/10/2018 dated 26.12.2018. Annual report for the year 2018 is under preparation, a copy of which is enclosed.
3.	Constitution of State Advisory Monitoring Committee and District Level Monitoring Committee	The State Level Advisory Body was reconstituted vide Order no: G.O(M.S) No.02/10/Envt dated 6.03.2010. Additional Chief Secretary, Health has been addressed to constitute State Advisory Monitoring Committee as per BMW Rules,2016.
4.	Authorisation to all Healthcare facilities including non-bedded HCFs.	As per the Bio Medical Waste Inventory,2017 there are 9331 Health Care Facilities operating in Kerala out of which Board has issued authorisation to 7314 HCFs including non bedded HCFs. Action is being taken to bring all the HCFs under the purview of Authorisation.
5.	Implementation status of Barcode system	Barcode system has been implemented.
6.	Monitoring of compliance to BMWM Rules 2016 by Healthcare facilities including Veterinary	Authorisation has been issued to 150no: of Veterinary hospitals and 1 Animal House. Direction has been issued to Department of Animal Husbandry to

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	Hospitals,AnimalHouses,AYUSH Hospitals	bring all these institutions to manage Bio Medical Waste as per BMW Rules 2016 and to obtain authorisation. 216 no: of AYUSH hospitals has been brought under the authorisation of the Board.
7.	Coverage of Common Biomedical Waste Treatment Facilities(CBWTFs)in the entire State/UT.	One CBMWTF operational at Palakkad, having a capacity of 37 Tonnes/day. The total quantity of biomedical waste generated in the state is 13771 TPA. 3 more CBMWTFs have been have been proposed in order to comply with distance norms from source to plant.
8.	Compliance of CBWTFs to new emission standards prescribed BMWM Rules 2016.	Periodical inspection is being carried out by the Board officials for compliance verification at IMAGE.Show Cause Notice has been served to IMAGE for not upgrading their existing incinerators to the emission standards prescribed under the BMW Rules 2016.
9.	Capacity Building programmes/training programmes to SPCBs/PCCs officials and HCFs.	18 no: of trainings on Bio Medical Waste has been conducted by the Board. More trainings will be conducted in this regard.

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4. E-Waste Management Rules,2016

4.1. Submission of Annual Report (Rule 18)

Annual report was submitted to the Central Pollution Control Board on 26-9-2018
(Rule 18) (Copy attached).

4.2 Collection Centers

a) Brand owners: As per the Action plan submitted by Producers/Brand owners, there are 105 collection centers. The collection centers of 12 producers in Thiruvananthapuram were inspected by Kerala State Pollution Control Board and noted that those centers are not in operation. The matter was reported to the Central Pollution Control Board and they have withdrawn the EPR authorization of 10 Producers including Samsung. The matter is being followed up for bring their collection centers to consent purview. Kerala State Pollution Control Board is considering enforcing 'Buy back Scheme', on producers and their retail establishments for channelizing the e-wastes to Registered recyclers and for reporting through Annual returns to the Board.

b) Recyclers: There are 11 collection centers.

4.3 Refurbisher

There is one refurbisher in Kollam district.

4.4 Registered Recycler

The Government is having a company named Clean Kerala Company for the collection of plastic and e-waste and channelization of e-waste to Registered recyclers. They had collected 736 TPA of e-waste in the year 2017-18. They had collected 1229 MT during 2016- 17, 2017-18 and 2018-19. The Clean Kerala Company has a proposal to set up E- Waste management facility and Integrated Plastic waste management facility at Kerala Industrial Infrastructure Development Corporation -KINFRA – park at Kuttippuram, Malappuram District. The KINFRA Management has allotted two plots of 1.50 acres for this purpose. The plants could be commissioned by March 2020. Also Clean Kerala Company has collected 40 T e-hazardous waste from the different Local Bodies of the State and handed over to Kerala Enviro Infrastructure Limited for safe disposal.

4.5 Earmarking or allocation of industrial space or shed for e-waste dismantling and recycling

The Department of Industries, was addressed to allocate the space in the Industrial park. A copy of the letters is enclosed. They have informed about the land at two places and the matter is being taken up.

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TOTAL AMOUNT COLLECTED FROM ERRING INDUSTRIES ON THE BASIS OF POLLUTER PAY'S PRINCIPLE 'PRECAUTIONARY PRINCIPLE AND DETAILS OF UTILIZATION OF FUNDS COLLECTED

	Company	Crore	Utilization of fund	Remarks
1	Binani Zinc Ltd, Ernakulam	0.5	Drinking water supply to nearby residents Edyar area in Kadungalloor Grama Panchayt	As per the order of Supreme Court Monitoring Committee
2	FACT Ltd., Ernakulam	1.25	Kuzhikandom cleaning	Kuzhikandom
3	FACT Ltd., Ernakulam	0.35	Drinking water supply to nearby residents(Eloor Municipality)	As per the order of Supreme Court Monitoring Committee
4	Hindalco Ltd., Ernakulam		Drinking water supply to nearby residents(Eloor Municipality)	As per the order of Supreme Court Monitoring Committee
5	Hindustan Insecticide Limited, Ernakulam	1.24	Kuzhikandom cleaning	Kuzhikandom
6	Hindustan Insecticide Limited, Ernakulam	0.35	Drinking water supply to nearby residents(Eloor Municipality)	As per the order of Supreme Court Monitoring Committee
7	Indian Rare Earths Limited	1.25	Kuzhikandom cleaning	Kuzhikandom
8	Indian Rare Earths Limited, Ernakulam	0.35	Drinking water supply to nearby residents(Eloor Municipality)	As per the order of Supreme Court Monitoring Committee
9	Kerala Minerals and Rutils Limited, Kollam	1		As per NGT order dated 31-8-2017 in Application No. 142,290, 453 of 2013

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10	Marthoma Granites,Thodupuzha	0.258516		Environment Protection Fund
11	Merchem Limited, Ernakulam	0.0875	Drinking water supply to nearby residents(Eloor Municipality)	As per the order of Supreme Court Monitoring Committee
12	New Hotel/Lodging house,Idukki	0.01		Environment Protection Fund
13	Organo fertilizers Ernakulam	0.025		Forfeiting of bank guarantee
14	Sree Sakthi Limited, Ernakualm	0.24		Forfeiting of bank guarantee
15	TCC Ltd, Ernakulam		Drinking water supply to nearby residents(Eloor Municipality)	As per the order of Supreme Court Monitoring Committee