

Annual Report
on
Biomedical Waste Management
as per
Biomedical Waste Management Rules, 2016
For the year 2021



Central Pollution Control Board
(Ministry of Environment Forest & Climate Change)
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1 Introduction

The Biomedical Waste has been regulated under Biomedical Waste Management Rules, 2016 (BMWM Rules, 2016) as notified under Environment (Protection) Act, 1986 by the Ministry of Environment Forest & Climate Change. These Rules were first notified in the year 1998 and then revamped in the year 2016 to implement these rules more effectively and to improve the collection, segregation, processing, treatment and disposal of bio-medical wastes in an environmentally sound management thereby, reducing the bio- medical waste generation and its impact on the environment.

BMWM Rules, 2016 prescribed specific duties for Occupier (such as 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), duties of the operator of Common Biomedical Waste Treatment Facilities (CBWTFs) and also duties for authorities like Ministry of Environment Forest & Climate Change (MoEF & CC), Ministry of Health & Family Welfare (MoH & FW), Ministry of Defence (MoD), Central Pollution Control Board (CPCB), State Government of Health (GoH), State Pollution Control Boards (SPCBs) /Pollution Control Committees (PCCs) and Municipalities or Urban Local Bodies (ULBs). The BMWM Rules, 2016 stipulates about provisions for segregation of biomedical waste as per the colour coded system (Yellow, Red, Blue and White) prescribed under said Rules. These Rules are applicable to all persons who generate, collect, receive, store, transport, treat, dispose, or handle bio medical waste in any form.

These Rules has mandate of preparation of Annual Inventory of biomedical waste generation, its collection, treatment and disposal under Rule 13. Every Occupier and Common Biomedical Waste Treatment Facility Operator is required to prepare annual inventory for biomedical waste management. Further, SPCBs/PCCs shall compile and submit the Annual Report to Central Pollution Control Board for the preceding year before 31st July of every year. Central Pollution Control Board shall compile, review and analyse the annual data submitted by SPCBs / PCCs and submit the same to MoEF &CC.

The inventory with respect to generation, treatment and disposal of biomedical waste is required for effective management of biomedical waste and implementation of BMWM Rules, 2016.

2 Status of Annual Report and Gaps identified

BMWM Rules, 2016 stipulate format for preparation of Annual Report by the Occupier and Operator of CBWTF in Form IV and format for preparation of Annual Report by State Pollution

Control Boards in Form IV(a). All States, Union Territories and Director General of Armed Forces Medical Services (DGAFMS) have submitted the annual reports on biomedical waste management for the year 2021.

States namely Andhra Pradesh, Bihar, Goa, Haryana, Himachal Pradesh, Lakshadweep, Madhya Pradesh, Maharashtra, Meghalaya, Mizoram, Nagaland, Odisha, Puducherry, Punjab, Rajasthan, Sikkim, Tamil Nadu, Telangana, Uttarakhand and West Bengal submitted the annual report information before July, 2022. However, SPCBs namely Andaman Nicobar, Arunachal Pradesh, Assam, Chandigarh, Chhattisgarh, Daman & Diu, Delhi, Gujarat, Jharkhand, J&K, Karnataka, Kerala, Manipur, Tripura, Uttar Pradesh & DGAFMS submitted the annual report information after July, 2022. Annual Report was submitted consistently delayed in the year 2020 and 2021 by SPCBs namely Assam, Chhattisgarh, Jharkhand, J & K, Karnataka, Tripura and U.P.

In the annual report information received from SPCBs/PCCs, following common gaps/ discrepancies have been observed and communicated to respective SPCB/PCC for clarification and rectification:

1. Health Care Facilities (HCFs) are operational without authorization.
2. Many bedded HCFs not installed liquid waste treatment facilities.
3. Information w.r.to deep burial installed by HCFs/CBWTFs is not provided
4. HCFs having captive treatment facility instead of using CBWTF
5. Many HCFs are not utilizing CBWTFs.

SPCBs namely Assam, Bihar, Chandigarh, Daman & Diu, Delhi, DGAFMS, Goa, Haryana, Himachal Pradesh, Kerala, Madhya Pradesh, Maharashtra, Mizoram, Nagaland, Odisha, Puducherry, Punjab, Sikkim, Tamil Nadu and West Bengal have submitted the clarification on above observations of CPCB and the same has been incorporated in this report. However, other SPCBs are not yet responded.

3 Bio-medical Waste management scenario

The total quantum of Biomedical Waste (BMW) generation was reported as 764 tonnes/day of BMW, out of which 721 tonnes/day BMW was treated and disposed off in the country. There are 3,75,256 no. of HCFs, out of which 1,21,396 no. of HCFs are bedded and 2,53,860 no. of HCFs are non-bedded. 2,62,786 no. of HCFs utilise the facilities of CBWTFs for the collection, treatment, & disposal of biomedical waste, while 13,605 HCFs have captive treatment facilities for the treatment and disposal of biomedical waste. There are 215 no. of CBWTFs in operation and 35 no. of CBWTFs are under construction. State-wise details of annual data on BMW is given at Annexure I. The brief BMW scenario of the Country is given below:

➤ No. of HCFs	: 3,75,256
➤ No. of bedded HCFs	: 1,21,396
➤ No. of non-bedded HCFs	: 2,53,860
➤ No. of beds	: 25,61,295
➤ No. of CBWTFs	: 215* + 35**
➤ No. of HCFs granted authorization	: 3,20,751
➤ No of HCFs utilizing CBWTFs	: 2,62,786
➤ No. of HCFs having Captive Treatment Facilities	: 13,605
➤ No. of Captive Incinerators Operated by HCFs	: 102
➤ Quantity of BMW generated in Tonnes/day	: 764
➤ Quantity of BMW treated in Tonnes/day	: 721
➤ No. of HCFs/CBWTFs violated BMW Rules	: 23,199
➤ No. of Show-Cause notices/Directions issued to defaulter HCFs/CBWTFs	: 15,355

Note: (i) * - CBWTFs in operation (ii) ** - CBWTFs under construction

4 Analysis of BMWM Scenario (in the Year 2020 and 2021)

As the data indicates the number of HCFs has been increased over the period, during the year 2020, total number of HCFs were reported as 3,52,014, however the same has increased to 3,75,256 in 2021. Also, total number of authorized healthcare facilities have been increased and there are 3,20,751 no. of HCFs are authorised out of 3,75,256 no. of HCFs. The increase in number of authorization reflects that the HCFs has been identified and authorized by respective SPCBs/PCCs under BMWM Rules, 2016.

The total generation of Biomedical Waste was about 774 tonnes per day in the year 2020. However, the amount of Biomedical Waste generated is estimated to be 764 tonnes per day in 2021. The decrease in amount of Biomedical Waste generation from year 2020 to 2021 in spite of increase in HCFs is may be due to decreased cases of COVID19 affected patients in year 2021.

Annual report information also shows that there is increase in number of CBWTFs from 208 to 215 in the year 2020 and 2021, respectively, for the treatment & disposal of generated biomedical waste. The same is also reflected as there is increase in number of HCFs utilising CBWTFs from 2,44,282 to 2,62,786 during the year 2020 and 2021, respectively. In addition to this, as there is increase in number of CBWTFs for treatment of biomedical waste, there is decrease in number of captive treatment facility from 17,206 to 13,605 and decrease in no. of captive incinerators from 125 to 102. The captive treatment facilities are majorly in operation in hilly areas and remote areas due to inaccessibility of CBWTFs. Detailed comparison on BMWM scenario during 2020 and 2021 is mentioned in Table 1 below:

Table 1: Comparative BMWM scenario in 2020 and 2021

Particulars	Year 2020	Year 2021
No. of HCFs	3,52,014	3,75,256
No. of bedded HCFs	1,13,186	1,21,396
No. of non-bedded HCFs	2,37,938	2,53,860
No. of beds	25,44,116	25,61,295
No. of CBWTFs	208	215* + 35**
No. of HCFs utilizing CBWTF	2,44,282	2,62,786
No. of HCFs granted authorization	1,60,736	3,20,751
No. of HCFs having Captive Treatment Facilities	17,206	13,605
No. of Captive Incinerators Operated by HCFs	125	102
Quantity of BMW generated (Tonnes/day)	774 (656 Non COVID + 118 COVID BMW)	764 (684 Non COVID BMW+80 COVID BMW)
Quantity of BMW treated in Tonnes/day	708	721
No. of HCFs violated BMW Rules	22,261	23,199
No. of Show-cause notices/Directions issued to defaulter HCFs	13,389	15,355

5 COVID waste management during 2020 to 2021

Biomedical waste generation has been increase due to COVID19 pandemic. For safe collection, transport, treatment and disposal of COVID19 biomedical waste, CPCB has prepared “guidelines for Handling, treatment and disposal of waste generated during treatment, diagnosis and quarantine of COVID-19 Patient” in year 2020.

5.1 Revision of CPCB Guidelines in year 2021:

CPCB guidelines for Handling, treatment and disposal of waste generated during treatment, diagnosis and quarantine of COVID-19 Patient has been revised during the year 2020 and 2021 as per requirement. In the year 2021, Rev.-5 of the guideline has been prepared wherein following changes have been incorporated:

- i. Used test kits may be collected separately as domestic hazardous waste characterized under Solid Waste Management Rules, 2016 by local bodies. For this purpose, local bodies may establish common waste deposition centres as per said Rules.
- ii. Users may deposit in nearby PHCs, CHCs, GMCs, hospitals and 24 hours' pharmacies for subsequent disposal through CBWTFs or manufacturers attached with them.
- iii. Disposal as per Manufacturer's instructions – these instructions may include (i) keep the used test kits separately for minimum 72 hours prior to disposal as dry solid waste, or (ii) use the disinfectant given along with kit by manufacturer or (iii) user may use any other disinfectant to disinfect the used kit prior to disposal with general solid waste as dry waste to ensure 10 log 4 reduction as specified under BMW Rules, 2016.
- iv. Above disposal options are same for the COVID-19 antigen home self-test kits showing both positive or negative test.

5.2 COVID19BWM tracking Application for COVID-19 biomedical waste

In May, 2020, CPCB developed a tracking application namely 'COVID19BWM', which is available on mobile as well as on web version. This application was developed for tracking of COVID-19 biomedical waste. CPCB guideline mandates use of COVID19BWM App by every COVID-19 biomedical waste generator like HCFs having COVID ICUs, quarantine centres/camps, home isolation/home care etc., captive treatment facilities and CBWTFs. The App has also been used during year 2021, around 10813 no. of waste generators was registered in the tracking app and reported in the App. Also, almost all CBWTFs were engaged in treatment & disposal of COVID-19 biomedical waste.

5.3 COVID -19 Biomedical Waste Management during 2021

CPCB reviewed status of COVID waste management in States/UTs during year 2021. As per the available information, an average of around 80 tonnes/day COVID-19 biomedical waste was generated, collected, treated and disposed of during year 2021. Month wise average COVID-19 biomedical waste generation in the Country during the period from January 2021 to December, 2021 is given in Table 2:

Further, during the year 2021, the highest generation of COVID-19 biomedical waste was reported during May 2021 which was about 7,067 Tonnes and the minimum generation of COVID-19 biomedical waste was reported during December 2021 which was about 713 Tonnes.

Table 2 - COVID-19 Biomedical Waste Management during 2021

S. No.	Months	COVID 19 BMW (Tonnes)
1.	January, 2021	1647
2.	February, 2021	1477
3.	March, 2021	2945
4.	April, 2021	3240
5.	May, 2021	7067
6.	June, 2021	4922
7.	July, 2021	2255
8.	August, 2021	1721
9.	September, 2021	1472
10.	October, 2021	1001
11.	November, 2021	738
12.	December, 2021	713
	Total	29,198 tonnes ~ 80 tonnes/day

6 Availability of Healthcare Facilities and their Authorization:

As per the annual report data provided by SPCBs and PCCs for the year 2021, there are 3,75,256 no. of HCFs, out of which 1,21,396 no. of HCFs are bedded and 2,53,860 no. of HCFs are non-bedded. Details of the number of HCFs in states/UTs and DGAFMS are given in fig. 1 and 2;

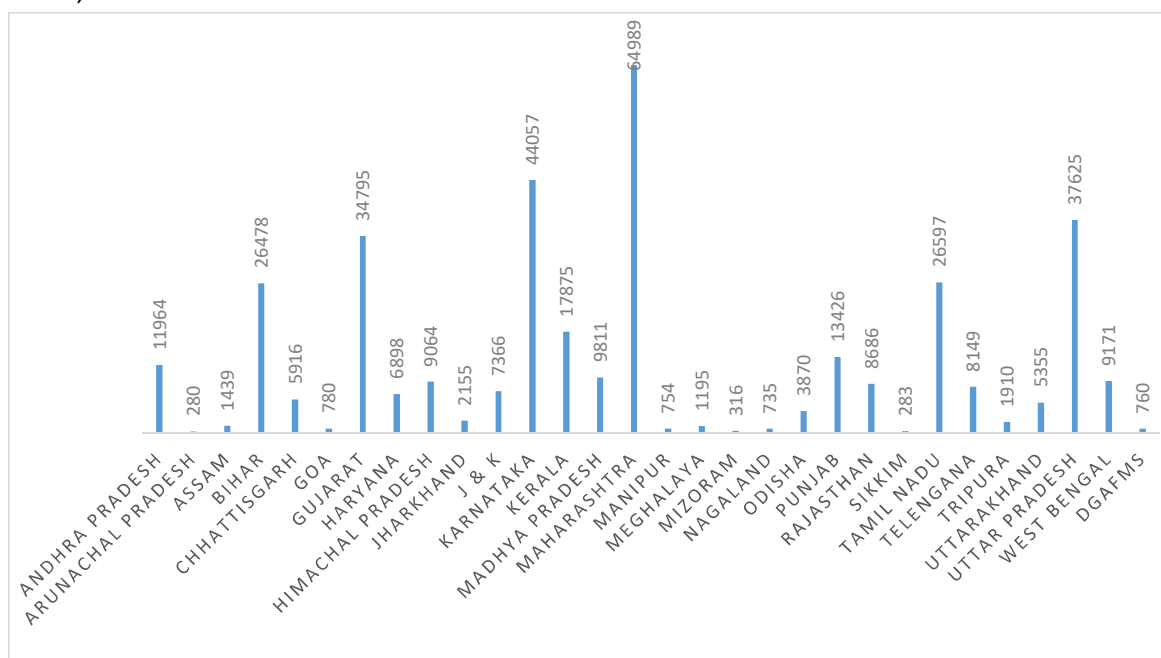


Fig : -1; No. of HCFs in States & DGAFMS

Fig. 1 shows that Maharashtra has the highest number of HCFs and also has highest number of identified and authorized HCFs. Whereas, Arunachal Pradesh has the lowest number of HCFs and less number of HCFs has been authorized. The requirement of HCFs may depend on many factors such as area of State/UT, population density etc.

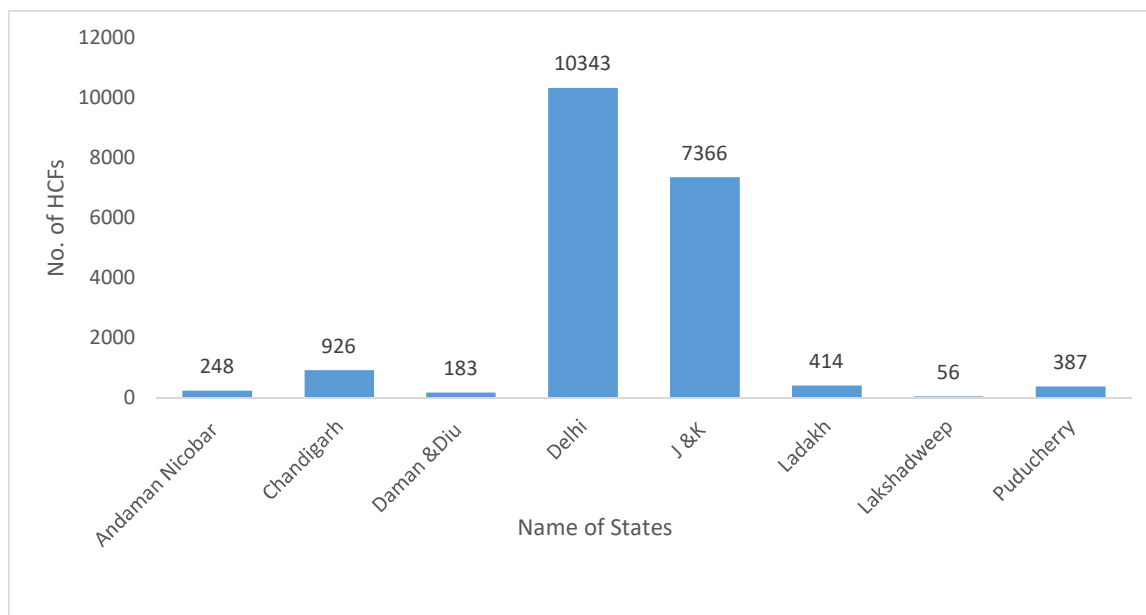


Fig: -2; No. of HCFs in 8 UTs

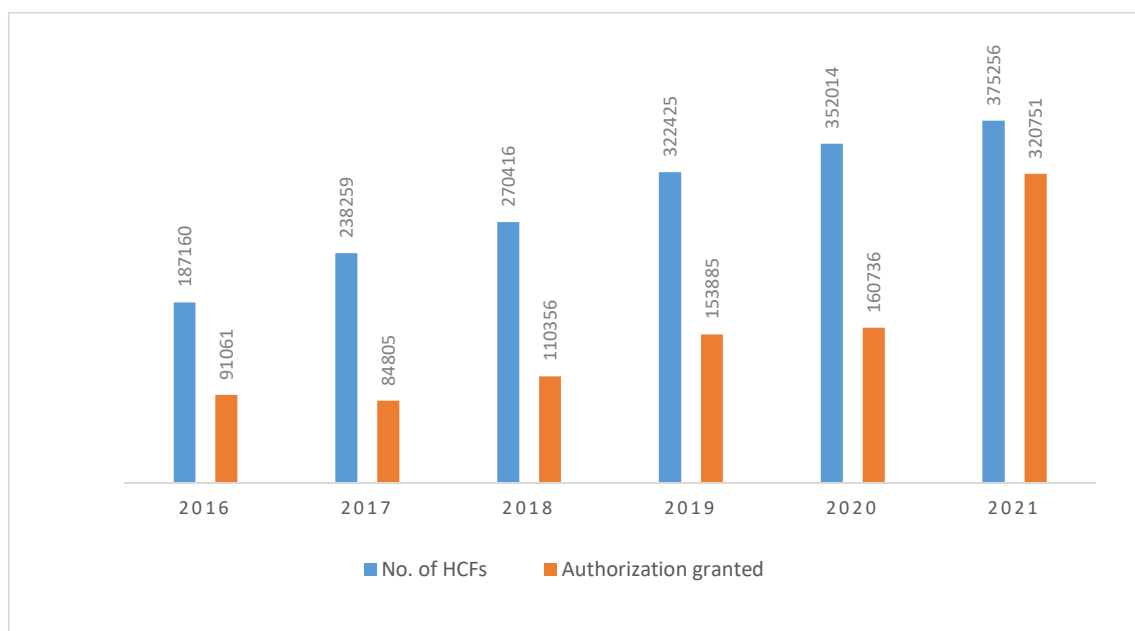


Fig: -3; No. of HCFs and their authorization reported by States/UTs since last five years

Authorization is a tool to capture the information regarding BMWM by the HCFs as well as by CBWTF operators. BMWM Rules, 2016 stipulate that every healthcare facility (bedded & non-bedded) require to obtain authorization from concerned SPCB/PCC. It has been observed that there are HCFs not yet authorized under BMWM Rules, 2016 which is a violation of BMWM Rules, 2016. SPCB/PCC should ensure authorization of every HCFs under BMWM Rules, 2016. Since 2018, the number of authorizations has increased with the increased number of HCFs. Details of the number of HCFs and their authorization reported by States/UTs since last five years are given in fig. 3.

Authorization to all HCFs has been issued by the SPCBs/PCCs namely Andaman & Nicobar, Chandigarh, Delhi, Ladakh, Lakshadweep, Manipur, Mizoram, Sikkim, Tripura, Tamilnadu and West Bengal. As per Annual report information of BMWM for the year 2021, HCFs are in operation without authorization in the States/UTs namely Jammu & Kashmir (81%), Arunachal Pradesh (74%), Bihar (64%), Goa (46%), Daman & Diu (36%) and Nagaland (28%). The same can be seen in fig. 4 i.e. for percentage of HCFs out of total number of HCFs in operation without applying authorization in States/UTs.

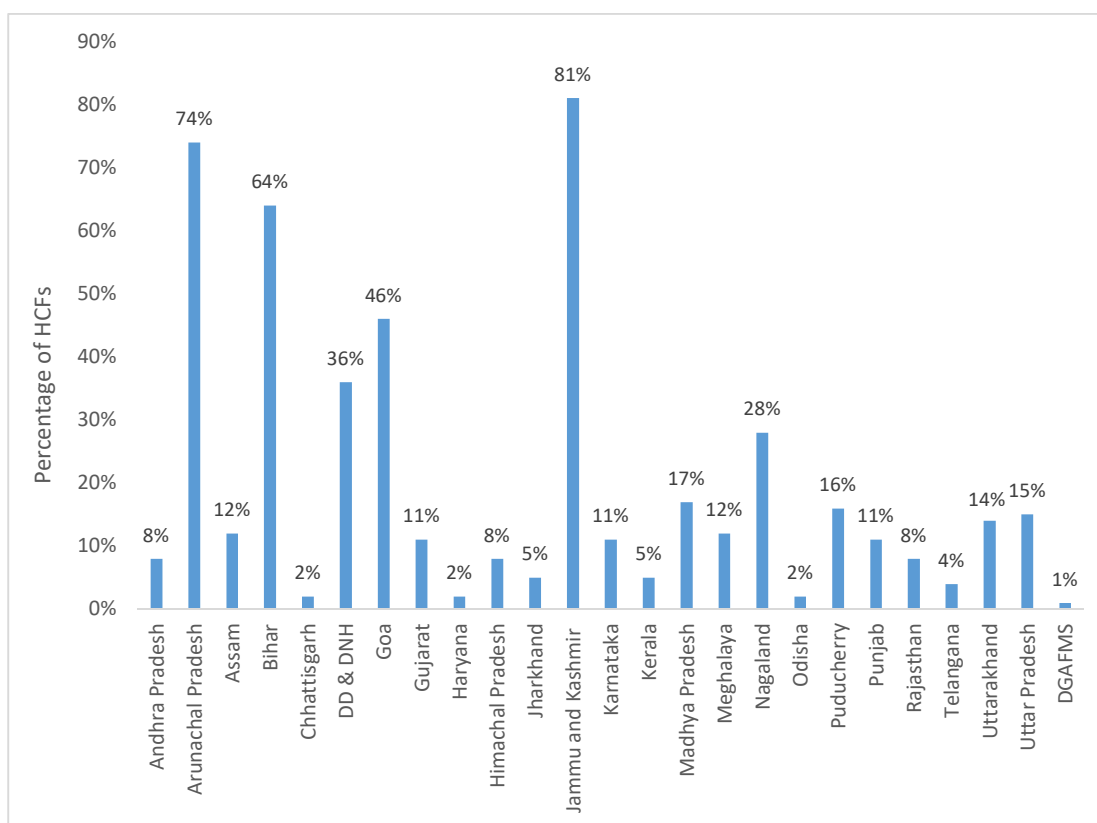


Fig: -4; Percentage of HCFs (Out of total number of HCFs) without applying authorization in States/UTs

7 Biomedical Waste Generation and Treatment

As reported by SPCBs/PCCs, about 764 tonnes/day of BMW were generated during the year 2021 by 3,75,256 numbers of HCFs. Out of 764 tonnes/day of BMW, 721 tonnes/day of BMW is treated and disposed of by CBWTFs and captive treatment facilities (CTFs) installed by Healthcare Facilities.

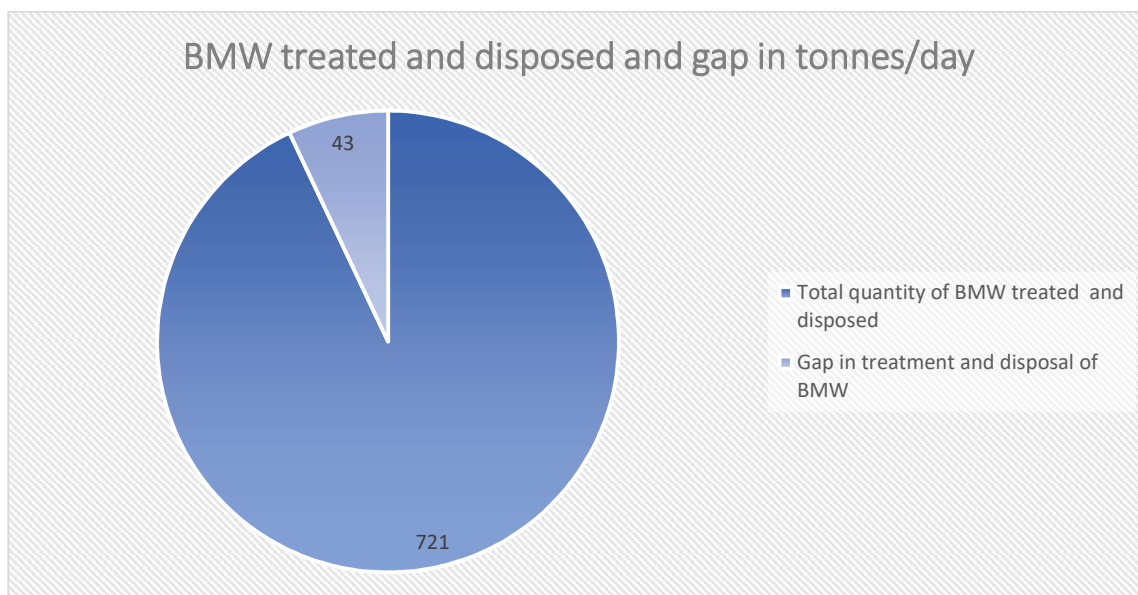


Fig: -5: Quantity of BMW treated & disposed and gap in tonnes/day

As per Annual report information for year 2021, there is a gap between BMW generation and its treatment & disposal. Figure 5 depicts the amount of BMW treated and disposed of, as well as the gap between treatment and disposal. CPCB has communicated the gaps observed to the respective SPCB/PCC to rectify the issue and ensure the disposal of all BMW generated in accordance with the BMWM Rules, 2016.

For environment friendly disposal of BMW there should be no gap between generation and treatment & disposal of biomedical waste. However, the gap in generation, treatment & disposal has been observed in States namely Assam, Bihar, Himachal Pradesh, Jharkhand, Karnataka, Madhya Pradesh, Nagaland, Tripura (fig. 6). Among the above States, the gap in generation, treatment, and disposal has also been observed in 2020 for Bihar, Karnataka, Madhya Pradesh and Nagaland, while the states of Kerala and Maharashtra filled the gap in 2021 for the generation and treatment of BMW.

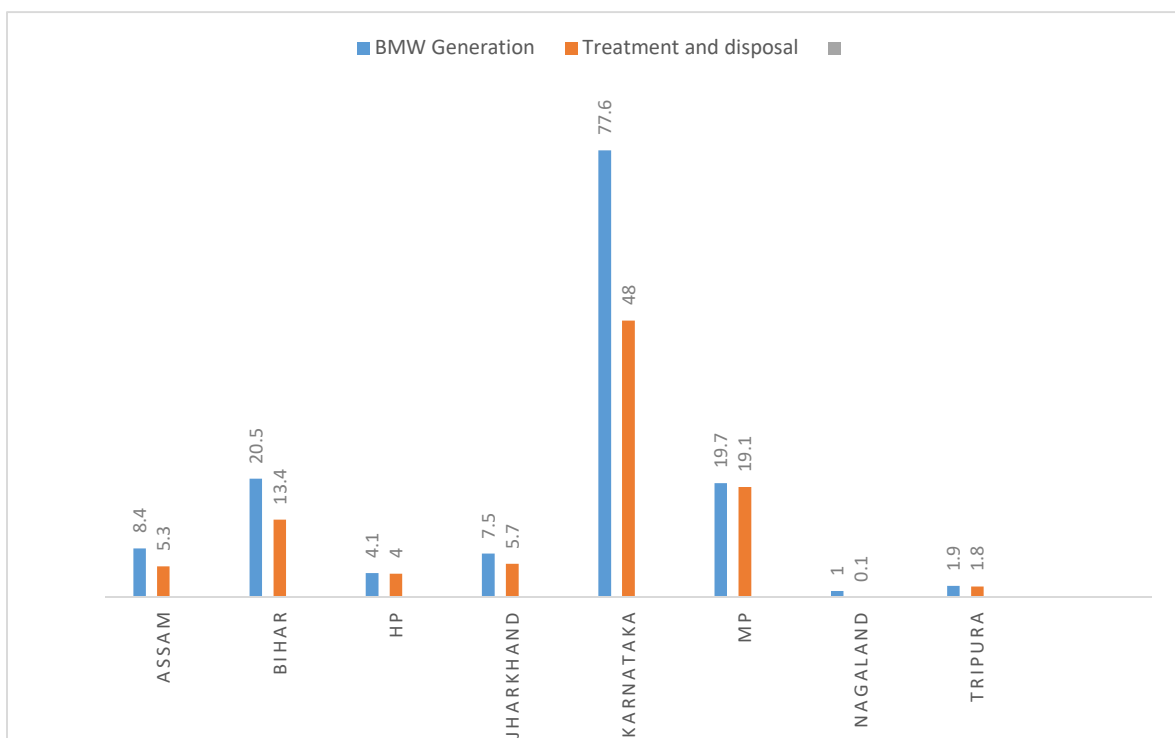


Fig: -6; Status of generation, treatment & disposal of BMW (tonnes/day)

7.1 Availability and adequacy of CBWTFs

As per BMWM Rules, 2016, it is the duty of CBWTF operator to take all necessary steps to ensure that the BMW collected from the occupier is transported, handled, stored, treated and disposed of, without any adverse effect to the human health and the environment, in accordance with BMWM Rules and guidelines issued by the CPCB.

As per the Annual Report Information submitted by SPCBs/PCCs for the year 2021, currently there are 215 numbers of CBWTFs operated in the Country and 35 CBWTFs are under construction. In 2021, there is increase in number of CBWTFs in Gujarat, Karnataka, Kerala, Madhya Pradesh, and Uttar Pradesh as compared to year 2020. States/UTs namely Andaman & Nicobar, Arunachal Pradesh, Ladakh, Lakshadweep, Mizoram, Nagaland, Sikkim, Tripura do not have CBWTFs for treatment and disposal of biomedical waste. In these States/UTs, Biomedical Waste is disposed of through captive treatment facility or deep burial. In this regard, CPCB requested such SPCBs/PCCs for submitting the proposal for setting up of CBWTFs for which they may avail financial assistance from Ministry of Environment Forests & Climate Change. State-wise details of CBWTFs is given below in fig. 7

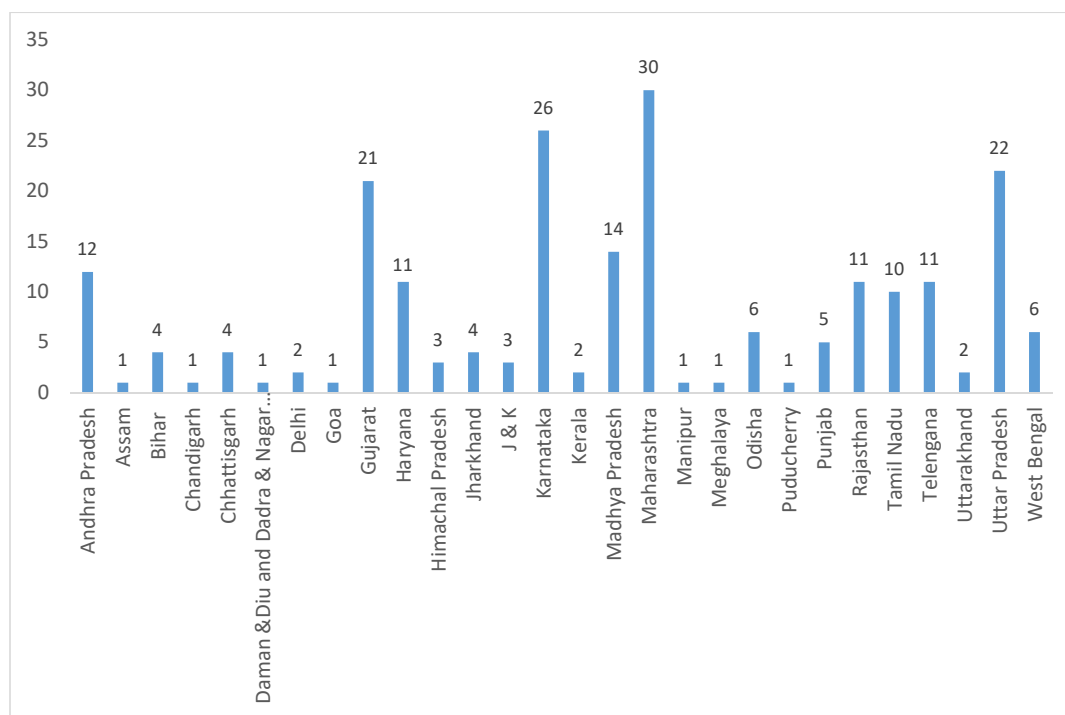


Fig 7:-No. of CBWTFs operational in the States/UTs

As shown in fig. 7, number of CBWTF varies in various States/UTs. The number of CBWTFs may depends on many factors such as number of HCFs, availability of capacity of CBWTFs, accessibility of CBWTFs, population density etc.

In States, Rajasthan and West Bengal, 7 new CBWTFs are proposed to cover all HCFs of State. Daman & Diu and Dadar Nagar Haveli has no CBWTF and handing over BMW to CBWTF situated at Gujarat (M/s En-Cler Biomedical Waste Pvt. Ltd.) for treatment and disposal of biomedical waste and Lakshadweep is handing over biomedical waste to CBWTF situated in Kerala (M/s IMAGE CBWTF in Kerala) for treatment and disposal of biomedical waste.

As per Annual Report information for year 2021, all HCFs operational in States/UTs namely Chandigarh, Delhi, Tamil Nadu, and West Bengal are using CBWTF for treatment and disposal of biomedical waste. In other States namely Bihar, Goa, Himachal Pradesh, Manipur, Odisha, and Uttarakhand, many of HCFs are still not using CBWTFs for treatment and disposal of biomedical waste. The reason of not using CBWTF is may be non-accessibility of CBWTF. States/UTs may look into the accessibility and come up with new CBWTFs to cover all HCFs in the State/UT. Utilization of CBWTFs by HCFs (in percentage) is given in fig. 8.

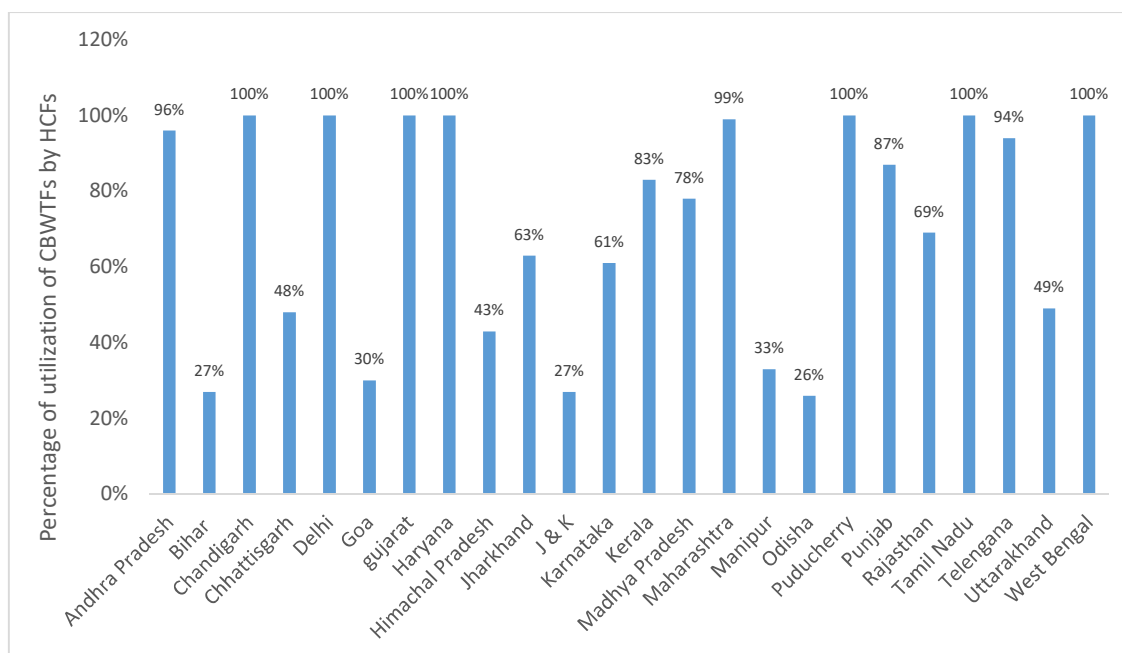


Fig:- 8; Utilization of CBWTFs by HCFs (in percentage) in State/UT.

The CBWTFs in the country are operating at cumulative treatment and disposal capacity of 1619 MT/day, of which incineration capacity is 890 MT/day and autoclave capacity is 729 MT/day. The present generation of 764 MT/day may look adequate for treatment and disposal of BMW. However, availability of CBWTFs may vary at State Level. Available treatment capacity of CBWTFs and utilisation of capacity in the country is shown in fig. 9.

SPCBs/PCCs have submitted compliance reports to the CPCB with respect to performance verification of CBWTFs as per the order passed by Hon'ble National Green Tribunal in the matter of O.A. No. 110 of 2020 regarding News item published on 01.07.2020 in "The Hindu" titled "Ramky Group accused of dumping biomedical waste in the open in Hosur". As per the report received from State Boards, 128 CBWTFs were monitored by the State Boards and 53 out of 128 CBWTFs monitored were reported as complying with the emission and effluent standards, having adequate infrastructure and reporting data as required under BMWM Rules, 2016. Further, common short-comings are given below: -

- i. Separate spaces for receiving untreated colour coded biomedical waste is not provided.
- ii. Details pertaining to Annual Report, treatment and authorization not shared on website.
- iii. Partial implementation of Bar-code tracking system.
- iv. Vehicles are not provided with GPS system.

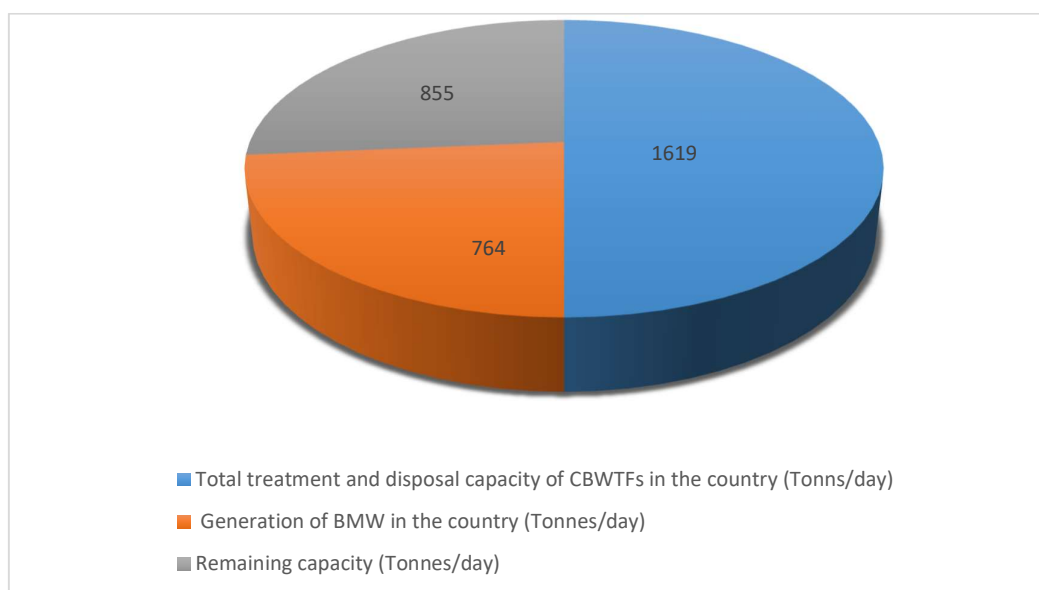


Fig :- 9; Treatment capacity available and utilization of capacity of CBWTFs in the country

7.2 Status of Captive Treatment Facilities

BMWM Rules, 2016 restricts on-site treatment and disposal facility, if a service of CBWTF is available at a distance of 75 Km. However, in case the CBWTF is not available, HCFs may install their own treatment facility for the treatment and disposal of BMW in compliance to the standards prescribed under said Rules. There are 13,605 numbers of captive treatment facilities installed by the Healthcare Facilities.

State namely Himachal Pradesh, Jharkhand, Kerala and Rajasthan have submitted the information on deep burial facilities. As per Annual Report information submitted by SPCBs/PCCs captive treatment facilities decrease in the country after 2019 (fig. 10). Further, CPCB has also issued directions to all SPCBs/PCCs regarding to ensure compliance to the standards prescribed under BMWM Rules, 2016 by captive treatment facilities operated by HCFs. In 2020, HCFs in the states of Haryana, Ladakh, Goa, Mizoram, and Nagaland operated captive incinerators, while in 2021, HCFs in the above states used CBWTF instead of captive incinerators. In addition, one CBWTF has been started in Goa State for the treatment and disposal of BMW.

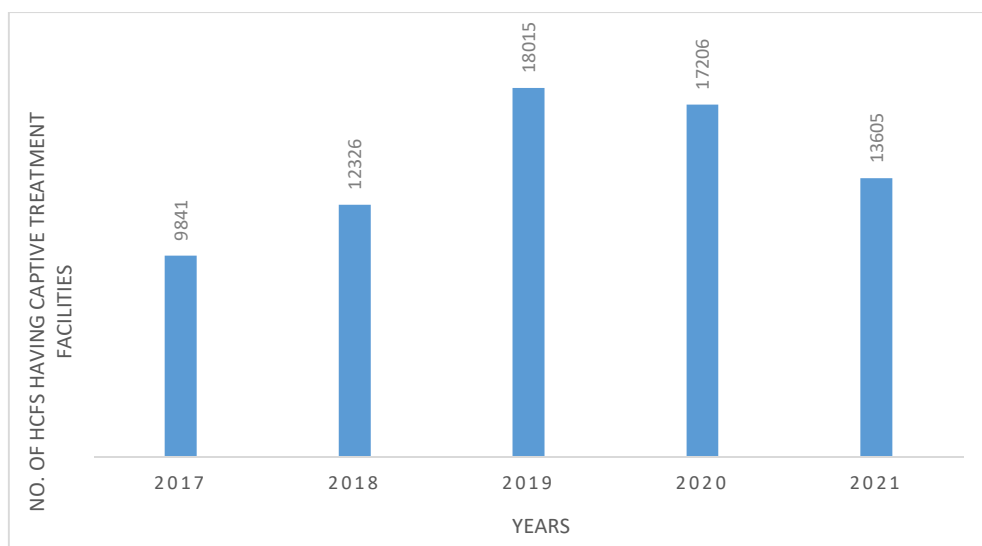


Fig: 10; Number of HCFs having captive treatment facilities

7.3 Status of deep burial

As per the revised guidelines for CBWTFs, SPCB/PCC should not allowed deep burial of BMW as a part of CBWTF. Any existing CBWTF having disposal of BMW by deep burial should have the requisite treatment equipment as stipulated under the BMW Rules. As per the information submitted by the SPCB/PCCs, deep burial pits installed by the HCFs of Andaman & Nicobar, Arunachal Pradesh, Himachal Pradesh, Jharkhand, Kerala, Madhya Pradesh, Meghalaya, Nagaland, Rajasthan and Sikkim States. The status of deep burial pits installed by HCFs is given in fig. 11. CPCB issued directions to all SPCBs/PCCs regarding verification of deep burial pits that they are authorized and designed in line with standards given under BMW Rules, 2016. Respective State Boards should initiate steps to set up CBWTF so as to avoid usage of deep burial pits.

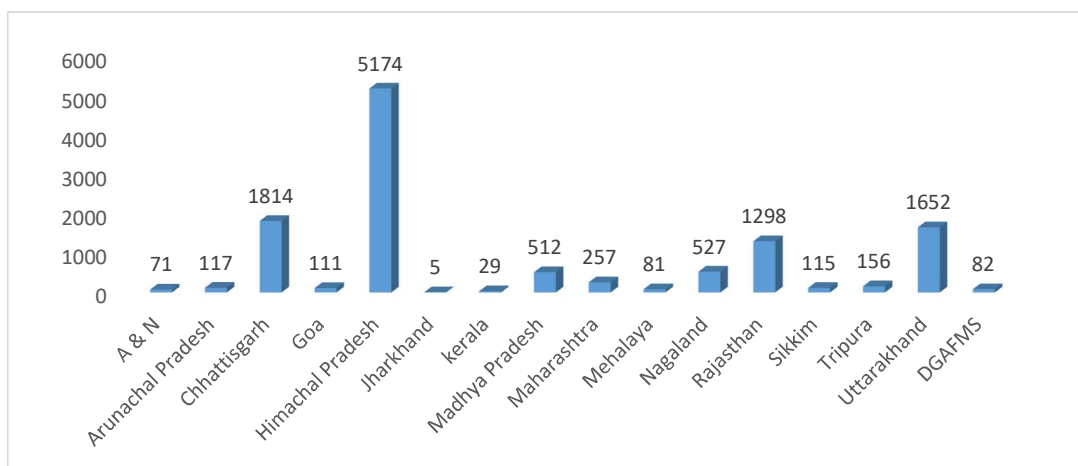
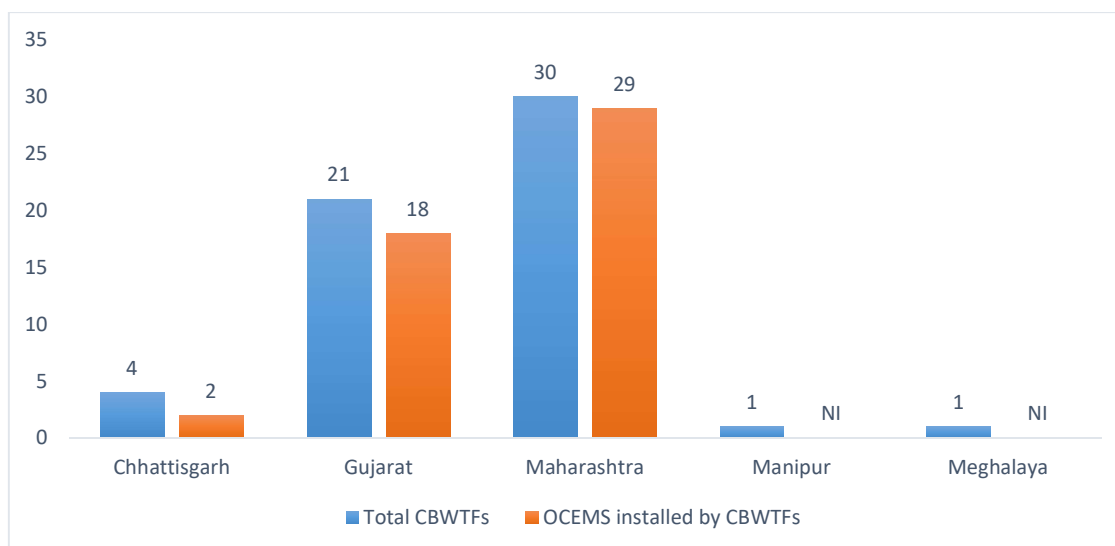


Fig:-11; Deep burial installed by HCFs in States/UTs

8 Online Continuous Emission Monitoring System:

BMWM Rules, 2016 stipulates that every occupier or operator of the common bio-medical waste treatment facility shall install Online Continuous Emission Monitoring System (OCEMS) for the parameters as stipulated by SPCBs/PCCs in authorization and transmit the real time data to the servers at SPCB/PCC and CPCB. As per the submitted information, 207 out of 215 nos. of CBWTFs have installed OCEMS with their incinerators. Further, it has been observed by CPCB that some of the CBWTFs connected to OCEMS portal are not transmitting data regularly to CPCB server. CPCB has conducted meetings with CBWTF operators related to connectivity and calibration of OCEMS and also issued directions to all SPCBs/PCCs regarding to ensure OCEMS data transmission to CPCB server. Details of CBWTFs installed OCEMS is given in fig. 12:



* NI – OCEMS not installed in CBWTF

Fig:- 12; Number of CBWTFs installed OCEMS

All operational CBWTFs of States namely Andhra Pradesh, Assam, Bihar, Chandigarh, Delhi, Goa, Haryana, Himachal Pradesh, J & K, Karnataka, Kerala, Madhya Pradesh, Odisha, Puducherry, Punjab, Rajasthan, Telangana, Tamil Nadu, Uttarakhand, Uttar Pradesh and West Bengal have installed OCEMS, however operational CBWTFs of states namely Manipur and Meghalaya have not installed OCEMS. Further, 2 CBWTFs are using deep burial in Chhattisgarh, 3 CBWTFs in Gujarat, and 1 CBWTF in Maharashtra have not installed OCEMS.

9 Status of Installation of Waste Water Treatment Facility

As per Schedule I of BMWM Rules, 2016, the chemical liquid waste shall be pre-treated before mixing with other wastewater. The combined discharge shall conform to the discharge norms given in Schedule III. Further, bedded HCFs are required to comply with the standard prescribed for liquid waste under Schedule II of BMWM Rules, 2016. However, HCFs may not

necessarily need to install Effluent Treatment Plant (ETP) in case waste water is discharged into a public sewer connected to a terminal sewage treatment plant (STP). Further, water disposed through public sewer are required to meet general standards as notified under the Environment (Protection) Act, 1986. However, all HCFs of Chandigarh State are in the process of installing ETP plant. In terms of installing of Waste Water Treatment Facility, several States are not up to par.

10 DGAFMS scenario

In case of HCFs for armed forces prescribed authority is DGAFMS. As reported, 760 HCFs are established under DGAFMS that generates about 5.8 tonnes/day bio-medical waste, which is entirely treated and disposed off by CBWTFs and Captive Treatment Facility. Out of 760 no. of HCFs, bedded HCFs and Nursing homes are 227, Clinics, Dispensaries are 527, Pathological laboratories are 2, Blood banks are 2 and Research Institutions are 2. Out of 760 no. of HCFs, 678 no. of HCFs are using CBWTFs and 82 no. of HCFs are using Captive Treatment Facility. Further, 1.4 tonnes/day of BMW is being treated by captive treatment facilities of HCFs, which is not recommended under BMWM Rules, 2016 and 4.4 tonnes/day BMW is being treated and disposed off by CBWTF. The status shows that the BMW disposal infrastructure in Armed Forces Medical Establishments does not meet the requirement of Rule. Steps may be taken to upgrade the facilities to ensure compliance of Rule.

11 Technologies for Treatment and Disposal of BMW

It has been observed that the non-burn technologies are available for the treatment & disposal of BMW. However, following provisions of BMWM Rules, 2016 restrict the adoption of non-burn technologies:

- i. Yellow category of BMW is allowed to be treat and dispose of through incineration/plasma pyrolysis/deep burial.
- ii. HCFs are not allowed to install captive treatment facilities in case the service of CBWTF is available within distance of 75 km. However, in case the CBWTF is not available, HCFs may install their own treatment facility for the treatment and disposal of BMW in compliance to the standards prescribed under BMWM Rules, 2016.
- iii. Combination of sterilization and shredding is only allowed for the red and white category of BMW.

Further, as per BMWM Rules, 2016, CPCB may lay down standards for new technologies for treatment and disposal of bio-medical waste and prescribe specifications for treatment and disposal of bio-medical wastes. The proposal for adopting new technology under BMWM Rules, 2016 may be submitted to MoEF &CC and CPCB for assessment of the same.

12 Adoption of Bar-code system

Rule 4 (i) of BMWM Rules, 2016, stipulate that it is the duty of every Health Care Facility (HCF) to establish a bar code system for bags or containers containing BMW to be sent out of the premises or place for any purpose, by 27.03.2019. Also, Rule 5 (c) of the BMWM Rules, 2016 stipulates that it is the duty of every Operator of CBWTF to establish bar code system for handling of BMW. To facilitate implementation of barcode system by Operators of CBWTFs and Hospitals at State levels, CPCB has prepared guidelines for “Barcode System for Effective Management of BMW”. According to the status of bar-code implementation received from SPCBs and PCCs, a total of 17,666 HCFs and 42 CBWTFs in 15 States/UTs have adopted the bar-code system.

Further, Hon’ble Supreme Court of India in the matter of IA No. 181745 of 2019 and I.A. No. 46339 of 2020, in W.P.C. 13029 of 1985 also passed orders directed MoEF & CC / CPCB to work out a national bar-coding system/portal for tracking of biomedical waste. In this matter, CPCB is in process of Implementation of Centralised Barcode System for tracking of biomedical waste.

13 Other issues of concern w.r.to bio-medical waste management

- District Level information of BMWM is not available in every State/UT which is required as per the BMWM Rules, 2016 as well as CPCB guidelines.
- Authorisation by every HCF including non-bedded is not achieved even after six years of notification of BMWM Rules, 2016.
- Domestic BMW is not collected separately from the households by the Urban Local Bodies as required under BMWM Rules, 2016.
- HCFs are using captive treatment facilities in some States instead of using CBWTFs. Further, timely monitoring of captive treatment facilities is required by States/UTs.
- Some CBWTFs and HCFs in the States/UTs have installed deep burial and many of the States/UTs has not provided information w.r.to deep burial pits installed by HCFs. Status of compliance by deep burial may be checked SPCBs/PCCs.
- Liquid waste treatment facility i.e ETP/STP is not installed by all bedded HCFs in the States.
- Gap analysis to assess the requirement of additional treatment facility to treat and dispose of the biomedical waste is not conducted as per CPCB guidelines.
- OCEMS is not effectively implemented by every CBWTF and captive treatment facility.

14 Actions may require/ Way forward

- SPCBs/PCCs shall ensure timely submission of annual report pertaining to their respective State or Union Territory within stipulated time period that is on or before 31st July.
- SPCBs/PCCs ensure to compile the information at District level as required under prescribed format. iv. SPCBs/PCCs shall coordinate with Urban Local Bodies and Municipalities for management of domestic biomedical waste as per Solid Waste Management Rules, 2016 for further channelization of domestic BMW to CBWTFs.
- SPCBs/PCCs should assess the adequacy of the deep burial pits used by the HCFs and ensure their restrictions up-to rural or remote areas and their compliance to deep burial standards as prescribed under BMWM Rules, 2016.
- Gap analysis should be conducted by all SPCBs/PCCs with respect to generation of BMW and available treatment capacity to check adequacy of available treatment capacity of CBWTF.
- SPCBs shall ensure that recyclable waste collected by CBMWTFs should be treated properly and provided to registered recyclers only.
- Adequacy of treatment capacity of existing CBWTFs and their compliance status be regularly assessed by the SPCBs/PCCs to review the requirement of additional treatment facility for the State / Union Territory.
- State Boards should closely monitor or track the movement of BMW generated by HCFs and treated and disposed through CBWTF.
- Any incidents or reports of illegal dumping or open burning of waste and non-complying facilities should be acted upon quickly and appropriate action may be initiated including imposition of Environmental Compensation Charges.
- SPCBs/PCCs may ensure that coverage of CBWTFs is available to every HCF to extent possible to ensure effective treatment and disposal of BMW.
- OCEMS installed in CBMWTFs be operated and maintained properly with regular calibration and quality check. Data be used for self-regulatory purpose.

Annexure -I																						
Annual Report information on BMWM Scenario in the Country for the Year 2021 (As submitted by SPCBs/PCCs and DGAFMS) as on March, 2023																						
S.No.	Name of the State/UT	Total no. of Bedded Health Care Facilities (HCFs)	Total no. of Non-bedded Health Care Facilities (HCFs)	Total no. Health Care Facilities (HCFs)	Total no. of Beds	Authorization Status			No. of HCFs utilization CBWTFs	Total Quantity of BMW generated (kg/day)	Total Quantity of BMW Treated and Disposed (kg/day)	Captive BMW Treatment Facilities Operated by the (HCFs)		Common Bio-medical Waste Treatment Facilities (CBWTFs)		Deep burial installed by HCF & CBWTFs		Total BMW treated by captive treatment facilities by HCF in Kg/day	Total BMW treated by CBWTFs kg/day)	Total no. of violation by HCFs/CBWTFs	Total No. of show cause notices/Direc tions issued to defaulter HCFs/CBWTFs	No. of CBWTFs that have installed OCEMS
						Total no. of HCFs applied for authorizat ion	Total no. of HCFs granted authorizatio n	Total no. of HCFs in operation without Authorizati on				No. of HCFs having Captive Treatment Facilities	No of Captive Incinerator s Operated by HCFs	CBWTFs Operatio -nal	CBWTFs under Constructi on	HCF	CBWTF s					
I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XIII.	XVI.	XV.	XVI.	XVII.	XVII I.	XIX.	XX.	XXI.	XXII.	XXIII.	XXIV.
1	Andaman Nicobar	53	195	248	1598	248	117	Nil	Nil	542.94	542.94	7	5	Nil	Nil	71	Nil	542.94	Nil	Nil	131	Nil
2	Andhra Pradesh	6511	5453	11964	156949	2860	2859	926	11431	19719.87	19719.87	Nil	0	12	1	Nil	Nil	Nil	19719.87	927	931	12
3	Arunachal Pradesh	140	140	280	1861	312	308	172	Nil	347.53	347.53	308	10	Nil	Nil	117	Nil	347.53	nil	172	172	Nil
4	Assam	732	707	1439	23860	896	391	173	339	8421.201	5359.31	457	26	1	Nil	INP	Nil	3478.81	1880.5	469	84	1
5	Bihar	6023	20455	26478	104391	2647	2188	16929	7049	20548.81	13421.55	3	2	4	Nil	Nil	Nil	344.69	13076.86	625	626	4
6	Chandigar h	44	882	926	4817	31	31	Nil	926	5374	5374	Nil	Nil	1	Nil	Nil	Nil	Nil	5374	Nil	Nil	1
7	Chhattisgar h	1924	3992	5916	44223	1300	1075	116	2857	7906.73	7906.73	1816	3	4	2	1814	2	1717.45	6189.28	154	0	2
8	Daman &Diu and Dadra & Nagar Haveli	73	110	183	1521	103	73	66	183	553.85	553.85	NIL	NIL	Waste Handover to Gujarat Facility	NIL	Nil	Nil	NIL	553.85	NIL	Nil	Nil
9	Delhi	1094	9249	10343	58120	1015	719	0	10343	25828.35	25828.35	1	Nil	2	Nil	Nil	Nil	148.35	25680	99	99	2
10	Goa	149	631	780	5051	159	90	363	236	1129	1129	329	Nil	1	Nil	111	Nil	Nil	1129	348	348	1
11	Gujarat	12221	22574	34795	187760	4479	3966	3714	34795	52800	52800	Nil	nil	21	1	Nil	Nil	Nil	52800	6181	6181	18
12	Haryana	3428	3470	6898	63509	5709	5588	179	6898	21436	21436	Nil	Nil	11	Nil	Nil	Nil	Nil	21436	179	179	11
13	Himachal Pradesh	607	8457	9064	16685	8341	7844	723	3886	4130.3	4067.04	2	2	3	1	5174	Nil	109.44	3957.6	26	26	3
14	Jharkhand	1200	955	2155	34873	737	250	104	1359	7523.86	5756.34	5	5	4	1	5	Nil	892.38	4863.96	119	30	4
15	J & K	1589	5777	7366	18102	1415	598	5951	2010	7663.5	7663.5	Nil	Nil	3	Nil	Nil	Nil	Nil	7663.5	5953	409	3
16	Karnataka	8944	35113	44057	229222	33430	177158	5148	27135	77639	48096.28	1904	2	26	2	Nil	Nil	2297	45799.28	2118	831	26

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17	Kerala	2095	15780	17875	124804	17106	16792	970	14936	61136	61136	44	15	2	Nil	29	Nil	2438	58698	1436	1497	2
18	Ladakh	334	80	414	1078	Nil	Nil	Nil	Nil	34.742	34.742	414	Nil	Nil	0	0	0	34.742	Nil	414	414	0
19	Lakshadweep	9	47	56	240	48	47	Nil	Nil	86.76	86.76	10	Nil	Nil	Nil	INP	Nil	Nil	86.76	Nil	Nil	Nil
20	Madhya Pradesh	4005	5806	9811	130000	8167	7897	1644	7656	19754.33	19124.73	2	2	14	5	512	2	202.82	18921.91	733	431	14
21	Maharashtra	20696	44293	64989	322873	7482	6445	160	64525	80314	80314	259	2	30	3	257	1	213	80101	336	302	29
22	Manipur	96	658	754	4854	754	754	Nil	248	1166.13	1266.22	506	2	1	Nil	INP	Nil	847.82	418.4	1	Nil	Nil
23	Meghalaya	183	1012	1195	7145	1046	1036	149	36	1287	1287	229	Nil	1	Nil	81	Nil	761	526	Nil	Nil	Nil
24	Mizoram	99	217	316	3546	25	25	Nil	Nil	803.57	803.57	99	Nil	Nil	Nil	INP	Nil	803.57	Nil	Nil	Nil	Nil
25	Nagaland	222	513	735	3660	529	529	206	Nil	1006.55	188.42	5	Nil	Nil	Nil	527	Nil	188.42	Nil	Nil	Nil	Nil
26	Odisha	1563	2307	3870	50609	718	682	69	987	16167.947	16167.947	2883	Nil	6	Nil	Nil	Nil	11563.579	4604.368	44	44	6
27	Puducherry	96	291	387	12112	324	304	63	387	4638.5	4638.5	1	1	1	Nil	Nil	Nil	19	4618.5	14	1	1
28	Punjab	4057	9369	13426	76945	4752	3881	1519	11756	18490.13	18490.13	Nil	Nil	5	Nil	Nil	Nil	Nil	18490.13	1293	1293	5
29	Rajasthan	5970	2716	8686	142473	1778	1662	708	6016	19170.28	19170.28	1298	Nil	11	7	1298	1	1821.97	17348.31	598	764	11
30	Sikkim	33	250	283	2299	283	283	Nil	Nil	545.34	545.34	192	7	Nil	nil	115	Nil	545.34	Nil	Nil	Nil	Nil
31	Tamil Nadu	7601	18996	26597	145848	26480	26393	Nil	26597	45215.93	45215.93	0	0	10	3	Nil	Nil	0	45215.93	21	21	10
32	Telangana	4221	3928	8149	122321	5979	5955	316	7696	24235	24235	Nil	Nil	11	Nil	Nil	Nil	Nil	24235	317	317	11
33	Tripura	141	1769	1910	4711	142	142	Nil	Nil	1940.264	1822.125	158	3	Nil	1	156	Nil	1822.125	Nil	Nil	Nil	Nil
34	Uttarakhand	1727	3628	5355	29231	4253	3935	749	2650	6891.37	6891.37	2582	2	2	1	1652	Nil	1206.72	5684.65	324	58	2
35	Uttar Pradesh	20397	17228	37625	356321	INP	31555	5550	INP	71264.2	71264.2	9	10	22	0	Nil	Nil	496.4	70767.8	150	20	22
36	West Bengal	2892	6279	9171	133415	9171	9171	Nil	9171	42286.861	42286.861	Nil	Nil	6	7	Nil	Nil	Nil	42286.861	148	146	6
37	DGAFMS	227	533	760	38659	8	8	1	678	5895.82	5895.82	82	3	Nil	Nil	82	Nil	1430.93	4464.89	Nil	Nil	Nil
	COVID-19 BMW									80*	80*											
	Total	121396	253860	375256	2561295	152727	320751	46668	262786	764*	721*	13605	102	215	35	12001	6	34274.0	606592.2	23199	15355	207

* Data provided in tonnes/day