

CHAPTER-VII

SUGGESTIONS

The researcher has studied various aspects of H&OWM Rules, 2016 for its effective implementation, compliance and enforcement. In due course of the study this researcher has passed through many issues dealt so far and following corrective action may be considered for suitable directions, if necessary.

On international perspective

1. In the twelfth meeting of the COPs, the updating of a national inventory of hazardous and other wastes was developed to assist parties to the convention to have information on wastes generation, imported and exported at national level. For an adequate and appropriate inventory, the representatives of the parties must have to submit information on the indicators by stipulated time. Adequate legal framework on wastes control, restriction and procedure on transboundary movement and generation of hazardous and other wastes would be possible solution to overcome the challenges experienced with national reporting system.
2. The lesson learned from the various conventions should be reviewed by the coordinating mechanisms of the parties to take steps for the implementation of the conventions. Such steps are training programme for custom authority and exporter; electronic information system between the competent authority and custom; voluntary electronic prior informed consent procedure among the parties; information exchange on cases of illegal traffic and trade.

3. Low participation and involvement has been found in the meetings of the parties to the conventions. There must be active participation of the parties to the convention to play their effective role in adopting and updating guidelines and handbook regarding working procedures to be discussed in new situations. Sometime it is observed that the criteria to be fulfilled while listing the chemicals are not listed under the convention. Therefore, some chemicals recommended for listing because of no consensus at the COPs. The secretariat should contact all the parties whether submitting or non-submitting of information to the chemical review committee as well as comments to add new chemicals to the convention.
4. It is found that several parties to the convention stated that the convention text needed to be amended to address current challenges for effective implementation of the convention. On the other hand some other disagreed with the opinion that lengthy rectification processes have negative impact to enhance the true aims of the convention. The secretariat should provide a platform to discuss and hear the concerns of parties to understand and address their concerns.
5. The regional, sub-regional and coordinating centers of the conventions should adopt strategic approaches for training and technical transfer, capacity building, using of fund's budget. Evaluation of the strategic approach or framework for implementation of the three conventions has not been conducted since its entry into force. The secretariat of the convention should identify the countries that need support. Better communication within the group would

have enabled it to advance more effectively. All are these vital to implement the convention.

6. For systematic and periodic publication of an annual inventory, role and responsibility of the organization and functions of different bodies of government need to be distinct and clear to avoid fragment and overlap mandates. Focal point must be designated by each and every party to the convention for submission of national report. Competent authority must be designated for control of illegal transboundary movement and have responsibility of keeping the information of export or import of hazardous wastes.
7. Separation of hazardous wastes from non-hazardous is a major challenge in implementation of HWMRs. Therefore, the definition of “hazardous wastes” must not be ambiguous in international treaty conventions as well as national legislation. Listed items of hazardous wastes must be categories and manage scientifically. Each party to the convention must establish legislation regarding authorisation of transport or disposal of hazardous wastes in or outside the nation and maintained register of. The broader control officials must be trained on illegal traffic of hazardous wastes to identify such cases under Basel, Rotterdam and Stockholm convention.
8. The government stakeholders, wastes generators, collectors, transporters, exporters, importers, disposers and as well as civil societies has played important role that leads successful implementation of conventional obligations. Awareness should be raised among such stakeholders to enter into

an agreement for the development of memorandum of understanding to provide, assist and incorporate each other for enhancing effectiveness of the convention. The developed nations, instead of ridiculing developing countries, must realize that to combat the problem of improper management and transboundary movement of hazardous waste, they must ensure transition to a low carbon economy which is fair and inclusive.

On national contexts

Grant of authorisation

1. The application of various clauses of H&OWM Rules, 2016 to the 'other waste' is not clearly defined in the rules and hardly any scrutiny for identification and quantification of hazardous waste has been carried out prior to grant of authorisation. Therefore 'other wastes' should be brought in the regulatory domain as Inventorisation of such wastes in upcoming annual inventory. All the categories of hazardous wastes, quantity of generation and dispose, mode of disposal shall stipulate clearly in the authorisation by the SPCBs/ PCCs. Every SPCBs/PCCs shall maintain a register containing all the conditions imposed on a particular industry or unit to run and open for inspection to all people. Furthermore, the SPCBs/PCCs shall create a website to upload the copy of authorisation, annual return, inventory of hazardous wastes and inspection report etc. for public information.
2. There is also need of guidelines or protocols for identification of by-products based on the manufacturing processes through involving chemical processes. It is also seems that the H&OWM Rules focuses on close loop approaches for

manifest system to track movement of hazardous wastes till its final disposal. But in cases of spent solvent recovery such system has ended at the door step of spent solvent recovery. Therefore for safe handling and management of spent solvent this manifest system would be applied right up to actual user of such recovered solvent. This should be adopted in all cases of recycle/reuse/recovery and utilization of oil, used oil, scrap, spent catalyst and spent acid. The SPCBs/PCCs shall setup mechanisms to evaluate scientifically and technically all the steps of products and by-products so as to identify and quantify the hazardous wastes generation, recycle, reuse, utilize, co-process and dispose through various means before grant of authorisation to a particular unit. The SPCBs/PCCs should create software and online submission of manifest received and reconciled the hazardous wastes handling data.

3. At the time of grant or renewal of the authorisation under Rule 6(2) and (3) of H&OWM Rules, 2016 the SPCBs/ PCCs must carried out specific verification and may add or remove scope of various facilities relating to the hazardous wastes management. Thereafter, incorporating the entire requirement the respective board or committee shall furnish the inspection report. The H&OWM Rules, 2016 requires for the enclosing of field inspection report while granting authorisation. Some SPCBs/PCCs have enclosed the same but such reports are found lacks details of generation, storage, recycle, reuse and dispose etc. The SPCBs/PCCs shall have to mention the mode of management for each category of hazardous wastes for every unit.

4. Most of the SPCBs/PCCs including SPCB of Assam have granted authorisation based on the declarations made by the occupier of the premises without assessing the various steps of production processes. The SPCBs or PCCs must gone through the production processes, type and quantity of hazardous wastes, material mass balance to identify the categories and quantities of hazardous wastes generated in the industrial practices within the ambit of authorisation. The board must conducted specific audit to verify the hazardous wastes generation and disposal quantities mentioned in the annual return.

Annual inventory

In order to comply with the provision of H&OWM Rules, 2016 for preparation of National Inventory of Hazardous Wastes generation and management the CPCB has prepared nine formats to obtain information from SPCBs/PCCs. Format A1 is for district wise details on number of hazardous wastes generating industries, quantity of landfillable, incinerable, recycle, utilizable hazardous wastes generated (both as per authorisation and annual returns), quantity of hazardous wastes imported and exported. The format circulated vide letter dated 04/06/2018 to all SPCBs/PCCs for submitting information on or before 30th September 2018. Except Mizoram SPCB all the others has submitted in October 2018, January 2019 and some other in July 2019. Only thirty one SPCBs/PCCs have submitted annual return for the year 2017-18 and four others have failed to submit annual inventory report.

The study reveals that there are there are a number of mismatch in the information provided by the SPCBs/PCCs likewise mismatch between the quantities

of each type of hazardous wastes generated (i.e. landfillable/ incinerable/ recyclable/ utilizable) and its management in terms of disposal/recycled/co-processed/stored), quantity of hazardous wastes generated as per annual return is more than authorised quantity, the quantity of interstate movement of hazardous wastes is not matched between the sender and receiver states, differences between quantity of wastes sent for recycling/co-processing/utilization and quantity reported in authorised capacity of hazardous wastes recycled/co-processed/utilized as per Format B, mismatch between quantity sent for common/captive TSDF with the quantity received at common/captive TSDF, differences between quantity recycled/dispose/co-process/reuse of hazardous waste and their authorised capacity, same quantity of hazardous wastes disposed in common and captive secured landfill are provided by the SPCBs/PCCs.

The CPCB directed to SPCBs/PCCs to submit revise annual inventory after verification of data or annual return furnished by the hazardous waste generating industries. Subsequently, 19 out of the 31 SPCBs/PCCs viz., Assam, Andhra Pradesh, Bihar, Chhattisgarh, Chandigarh Goa, Delhi, Gujarat, Himachal Pradesh, Puducherry, Maharashtra, Tamil Nadu, Nagaland, Sikkim, Odisha, Uttar Pradesh, Uttarakhand, West Bengal have submitted their revised annual inventory. Most of the state reported that not all the occupier have submitted annual return and state like Kerala, Meghalaya and Assam has not submitted interstate movement of hazardous wastes. Furthermore some states likewise Arunachal Pradesh, Andaman & Nicobar, Lakshadweep and Manipur has not submitted their annual inventory to the CPCB therefore the board could not incorporate in National Inventory of 2017-18.

Inventorisation of hazardous wastes is most important tool for reporting of hazardous wastes generation, store, reuse, recycle and dispose data in a state/UT. But it is found that such data are not verified and validated based on scientific principles due to lack of standard protocols and guidelines. Therefore, there are substantial variation in the quantity declared in the authorisation and actual quantity declared in annual return by the hazardous waste generating units. Some time the quantity of hazardous waste in captive utilization is found higher but is not verified. Preparation of standard guidelines or protocol by MoEF&CC and CPCB; verification and validation of data by the SPCBs/PCCs; timely submission of annual return by the units; timeline for inventory preparation by the SPCBs/PCCs will be probable solution to overcome from such problem.

Recycle/reuse of HW

1. The quantum of hazardous wastes recycle/reuse seems very less in the states like Rajasthan, Punjab, West Bengal and Maharashtra. The study reveals that the quantity of recycle and utilization is very less than its generation likewise in Gujarat 36% on the other hand in Maharashtra 0.98% of hazardous wastes is recycled and utilized though the H&OWM Rules, 2016 provides for promoting maximum utilization and recycling. Therefore immediate guideline should be prepared to regulate the performance of such units in cases of non-compliance.
2. It is observed that investigation of claims made by the industries requires more clarity on the application of Rule 9 of the H&OWM Rules particularly captive utilization which is operated totally relied on data as provided by the unit. In case of pre-processing units they collect hazardous wastes from different

industries for co-processing so necessary monitoring and reporting of data is required to ensure consistency and uniformity. Therefore, the SPCBS/PCCS should verified the data and prepared inventory after field inspection for sound utilization, recycle, pre-processing and co-processing to develop environmental benchmark. Scientific study has been carried out by the concern authority for utilization of incinerable and landfill able hazardous wastes in cement plant.

3. There are a lot of scopes for improvement in the figure of hazardous wastes reuse/recycle. For this, the SPCBs/PCCs must take initiative for capacity building programmes. The CPCB must prepare single SOP to cover large number of units and EPR (Extended Producer Responsibility) to regulate the wastes generator to make him responsible throughout handling of wastes till its disposal. The board also can make agreement with the generator and recycler/co-processor to enhance and improve strategic approaches. The state authority can also attempt to establish model like Novel Spent Acid Management, Ahmadabad for hazardous wastes management. The pre-processing and co-processing units must send their periodic report with detail characteristic of each supply to SPCBs/PCCs. The common TSDF can be used for pre-process and send the wastes in dedicated vehicle of common TSDF for co-processing. The co-processing and pre-processing units have several benefits for sound management of hazardous wastes as it converts wastes into non-waste.
4. In December, 2018 the CPCB has prepared 48 SOPs for utilization of various categories of hazardous wastes. Rule 9 of H&OWM Rules, 2016 provides for

obtaining of authorisation from the SPCBs/PCCs for utilization of hazardous wastes as a resource after pre-processing either for co-processing or for any other use on the basis of SOPs prepared by the CPCB. The recycle/reuse/recovery and utilization units should have possessed critical infrastructure facility for environmentally sound management of hazardous wastes so as to ensure enhanced level, frequency of enforcement and environmental monitoring.

Spent solving industries

The two spent solving industries M/S Ramkamal Chemicals Pvt. Ltd. A-77 and M/S Shiv Shakti Oxalate Pvt. Ltd. A-94/1 in Kurkumbh MIDC Maharashtra are found not aware of SOPs prepared by the CPCB and Rule 9 of the H&OWM Rules, 2016. The industries are used to purchase spent solvent from outside state without having authorisation, manifest system and appropriate facility to store. The updated information of authorisation is not available with Maharashtra SPCB. All the SPCBs/PCCs shall publish updated information on recycling and reuse of hazardous wastes including spent solving on respective website and shall conduct audit and inspection in due time.

Common Effluent Treat Plants

Most of the Common Effluent Treat Plants (CETP) is not able to achieve stipulated discharge standard due to higher concentration of the inlet effluent which is exceeding the parameters over the design inlet criteria. It is observed that some errant industries are adopting this practice of CETP discharge to reduce the cost of disposal. Inadequate disposal of sludge from CETP into the water bodies through the effluent is

a violation of H&OWM Rules, 2016. After the recommendation of the committee the CPCB have sent questionnaire to the SPCBs and it is very unfortunate that only 9 states have submitted their responses namely; Andhra Pradesh, Madhya Pradesh, Gujarat, Punjab, Karnataka, Tamil Nadu, Kerala, Himachal Pradesh. The states who have not submitted their information shall submit as soon as possible and shall conduct monthly verification of CETP performance and take legal action if any violation is found under Rule 23(1) of H&OWM Rules, 2016.

Such unit must installed CC camera to intensively monitor the practices of unit in respect of non compliance of H&OWM Rules, 2016. The unit must not used fresh water for industrial purpose but used pumped water as per the direction of SPCBs/PCCs. So, such activities must be verified. The unit must install a state of art RO for prefiltration of suspended material in the ground water. Bore well must be dug on the other part of the unit so that rain water can maintain the yield from the bore well. During the rainy season the cannel water overflow that may contaminants the ground water therefore the effluents must be conveyed through pipe line. It is found that few companies are still discharge hazardous wastes in to the conveyance system.

An appropriate action plan shall be prepared to maximum use of treated effluent so as to minimize the demand for fresh water. The industries shall ensure that discharge of effluent into the pipe line shall not exceed the maximum designed capacity. The monitoring committee recommended for establishment of fenton oxidation system by 31st January 2019 and attention must be given to increase the pumping of ground water so that speedy contamination will be possible.

Common TSDF

The state government, operator of a facility, occupier or any association of occupier shall responsible whether individually or jointly to identify sites for establishment of common TSDF of the hazardous and other wastes in the state under Rule 16(1) of H&OWM Rules, 2016. The study reveals that only 16 states have common TSDFs such as Gujarat, Jharkhand, Haryana, Andhra Pradesh, Madhya Pradesh, Karnataka, Maharashtra, Tamil Nadu, Rajasthan, Uttar Pradesh, Telangana, Uttarakhand, West Bengal, Goa, Odisha, Diu, Daman, Dadra and Nagar Haveli. On the other hand 4 states namely Kerala, Punjab, Odisha and Himachal Pradesh have only common secured landfill and remaining 17 states namely Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura, Puducherry, Arunachal Pradesh, Aandaman& Nicobar, Lakshadweep, Delhi, Bihar, Chhattisgarh and Chandigarh do not have both the facilities.

To stabilization of hazardous wastes the CPCB shall communicate directions and guidelines to the operator for taking necessary action and upgrading the facilities. The TSDFs and SLF of Roorkee, Kanpur, Tumakuru are not seemed strictly follow the CPCB's guidelines. It is found that fire incident has been took place in some TSDF located at Ankaleshwar and Hyderabad that indicates non-establishment of firefighting system. The SPCBs/PCCs could not monitor the TSDF at the time of construction expert teams need to be engaged to check the layout and designed parameters. Third party audit shall be required to cross verify the chemical use for various purposes and consumption of additives in the operation of TSDFs. Design, layout and site selection for establishment of TSDF are the critical parameters for that reason the TSDF of

Balotra, Roorkee and Kanpur are found non-compliance of criteria. Land filling, incineration, leachate management, storage and stabilization are critical operation that requires appropriate measure therefore, the SPCBs/PCCs shall conduct environmental audit and taking necessary action.

Import and export

It is observed that the importer has given the fraudulent declaration for importation of intended material such as paper waste is used for the importation of municipal solid wastes. Due to insufficient fund the custom authority could not disposed the seized hazardous waste. Lack of co-ordination between the custom authority and MoEF&CC seems to be observed. The custom authority has duty to inform the ministry in cases of any illegal trafficking of hazardous waste under schedule VII of H&OWM Rules, 2016. But since the notification of the Rule not a single has been reported by the custom authority. The authority must use Risk Management System to enable low risk consignment and separate fund need to be created for environmentally sound management of seized hazardous wastes

The study reveals that there two codes are followed at the time of import and export separately by the two authority in India. The Basel code that provides the list of non-hazardous wastes for which permission in not required which is followed by MoEF&CC on the other hand DGFT follows the HS code which defines the productions of animal origin, vegetable plaiting materials and vegetable products not elsewhere specified. The custom authority in India uses Risk Management System (RMS) to enable low risk consignment where it is found that only ten percent of the containers cover under such system out of thirty percent has been physically verified.

Therefore different types of waste streams are not included in RMA and some time the importer mis-declared such waste streams. Therefore, the SPCBs/PCCs should reviewed the import/export data of various wastes streams to identified and added to RMS and should synchronized the two code to avoid confusion with the collaboration between authorities.

Contaminated site.

As per the direction of Hon'ble Supre Court in WP 657/1995 with regard to contaminated site, the MoEF&CC/CPCB have identified 329 hazardous waste contaminated sites out of which 144 has been verified by the respective SPCBS/PCCs and 57 are still under evaluation. The CPCB's waste management division identified total four numbers of contaminated sites in Assam where three required probable sites assessments and only one confirmed contaminated site is found. Eight sites out of 144 sites are prioritized for assessment and remediation has been prepared. It is a very elaborate process and requires strong financial resources for mobilizing remediation process. The study reveals that India has limited experience on remediation of contaminated sites. Projects should be initiated by the MoEF&CC under Capacity Building for Industrial Pollution Management Project (CBIPMP) and National Clean Energy Fund (NCEF) to assist the CPCB/ SPCBs/PCCs to understand the gaps in existing legal frame work and organization to undertake actual remediation projects.

Therefore, the MoEF&CC/CPCB/SPCBs/PCCs and respective government shall take initiatives to prepare standard protocol to verify the sites; provide financial support for speedy evaluation of remaining sites to safeguard the people from existing threat from contaminated sites. Therefore, it is need of hour to focus on stringent

enforcement of H&OWM Rules, 2016 and remediation of contaminated sites. To hasten the remediation processes harvesting of rain water, reuse of treated effluent so that fresh water abstraction could be minimized by maximizing the abstraction of water from shallow well, drilled of more abstraction well near the SLF prime requisite to enhance the remediation process.

By-products

Some inorganic by-products like salt, acid, bases are sold and use without any processing and examination of contamination in various ancillary industries which may have impact on human health and environment. For example spent sulphuric acid is produced from dye and dye intermediates and considered as by-product by the generator as it contains 30% to 70% sulphuric acid that can be used in production of single super phosphate which may have adverse effect on soil, water bodies and plants. Therefore spent acid cannot be consider as by-product and need to be regulated under Rule 9 of the H&OWM Rule, 2016 by preparing SOPs. Therefore the provision of by-product must be clear otherwise it can be misused by the hazardous wastes generator to escape from the stringent provision of the Rule.

There is no proper guideline or provision under the H&OWM Rules, 2016 to enforce by the SPCBs/PCCs regarding to make a clear distinction between waste and non-waste by-products. Suppose some materials are not the main object of production process but can be consider as non-wastes by-product. In this situation there is possibility of mis-use the term by-product by the generator to avoid the stringent provision of law. Therefore, by-product should be treated as wastes.

On SPCB of Assam*Annual inventory of Assam*

The researcher observed that the annual inventory prepared by the SPCB of Assam is not comprehensive and cannot be taken as holistic representative of the actual scenario of hazardous wastes management. Standard protocol need to be developed for verification and validation of data of hazardous waste generation and dispose through involvement of scientific and academic institutes. The board must create software to up load all such data of interstate transport of hazardous wastes, reconciliation of data and signal for non-closure of manifest loop. Therefore, the board must prepared credible and reliable annual inventory through advance mechanism and integrated approaches from all stakeholders.

It is found from the study that the periodic inspection of hazardous wastes handling units are not notified the SPCB of Assam. Furthermore, monitoring report of compliance of various provisions including permission for import and export are not submitted by the SPCB of Assam during 2017-18. Furthermore, Assam has reporting of captive SLF during 2016-17 inventories but now reporting non-existing of such facility. As per the CPCB guideline every SPCBs/PCCs must constitute in-house Hazardous Wastes Response Team with regard to impose financial penalty for environmental damages due to handling and disposal of hazardous wastes. But it is found from the study that SPCB of Assam has not been able to constitute such team and imposed financial penalty under Rule 23 of the H&OWM Rules, 2016.

Recycle/reuse of HW

The H&OWM Rules, 2016 ensures for resource recovery/reuse/recycle/co-process/ utilization of hazardous wastes. For this, the hazardous wastes clearly distinguished from other wastes. Such other wastes are waste tyre, paper wastes, metal scrap, used electronic items are recognized source of recycle and reuse. It is found that the name of Assam is not found among the top 10 states contributed in recycling, utilization and co-processing of hazardous wastes in the country. The states of Assam have not in possession of any encouraging policy for reuse/recycle and co-processing of hazardous wastes. To strengthen the provision of recycle/reuse/recovery/utilization and co-process, the wastes generator is required to follow waste management hierarchy which includes priority of prevention, minimization, control, recycle, reuse and safe handling of hazardous wastes.

It is found from the study that enforcement of e-waste management rules and solid waste management rules have impact on the provision of H&OWM Rules, 2016. Suppose fluorescent and other mercury containing lamp are cover under the e-wastes management but there are no recycler for such wastes. After pre-treatment of such wastes have to send to common TSDF and accounted into hazardous wastes Inventorisation. Therefore, the SPCBs/PCCs should take cognizance of such aspects while enforcing the relevant legislations.

Proposed TSDF in Assam

Though the NGT in its order dated 30/07/2018 directed that the states/UTs not having common TSDF must submit action plan for the same within three months timeframe. But it is found that only 16 states/UTs have able to follow the direction as

on 08/01/2019 and rest of some others under process and remaining another has not taken any action. The state of Assam should comply with the order of NGT dated 30/07/2018 in the matter of O. A. No. 804/2017 and must set up TSDF at appropriate location. The management practices of hazardous wastes in Assam are recycling, reprocessing, captive treatment, captive SLF, captive incinerator. Initiatives are being taken by the state government and a plot of land measuring 100 bigha at Geleki of Sivsagar district allotted for setting up of TSDF is under progress. But the proposal is pending since 11th February 2016 for approval of the Assam government.

Such TSDF should monitor the ground water around the TSDF, leachate collection, analysis and its treatment to ensure healthy environment. The TSDF need to be standard designed as per guideline of CPCB. The states not having TSDF likewise Assam, Goa, Bihar, Jammu&Kashmir, Chhattisgarh, Puducherry and others need for expediting set up TSDFs in the states. In such a situation sharing arrangement with states/UTs having common TSDF may also considered as an alternate. Furthermore, discussion has been carried out among the nearby states for sharing of common TSDF based on feasibility and viability.

It is also to be considered that the smaller quantities of hazardous wastes generating North Eastern states such as Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Arunachal Pradesh may co-ordinate with the Assam government for sharing proposed common TSDF. The government can seek necessary technical assistance from CPCB to mitigate any problem.

Action taken

It is observed that there are several cases of non-compliance of H&OWM Rules, 2016 by the SPCBs/PCCs against the violation of provisions. There are hardly few cases of cancellation of authorisation, issuance of closure notice and imposing penalty to the violators. Therefore, the habitual and serious defaulter gets courage from such stillness of the SPCBs/PCCs. The **SPCBs**/PCCs should exercise the power conferred under Rule 23(1) and (2) of the H&OWM Rules 2016 against the defaulter. There shall be an effective framework that will remove the ambiguity in regulatory action which can bring transparency, predictability and consistency in enforcement.

Prior to the NGT order dated 30/07/2018, the CPCB of India issued a direction vide order dated 12/06/2018 to SPCBs/PCCs with regard to closure of violating units, impose of penalty and maintenance of record and submission of annual inventory etc. but it is found that only 9 SPCBs/PCCs such as Assam, Odisha, Jammu & Kashmir, Delhi, Nagaland, Goa, Lakshadweep, Chandigarh and Chhattisgarh have responded to the said direction. Two units violating H&OWM Rules, 2016 has been closed by Puduchhery PCC. Chhattisgarh and Assam has send show cause notice. It has been found that only the state of Odisha has filed the list of hazardous wastes generating industries or units against whom action has been taken for violation of H&OWM Rules, 2016.

Laboratory facility

Laboratory is the essential tool in assessing the status of environmental components which may provide qualitative as well as quantitative data if it is well equipped. The parameters to be analyzed for various laboratories are given in Schedule

II to IV of the H&OWM Rules, 2016. Sufficient number of laboratories staff is required with qualified and trained in deal with hazardous wastes sample.

Most of the SPCBs/PCCs do not have well equipped laboratories with advanced facilities to sampling and analysis of hazardous wastes. There is non-availability of dedicated hazardous wastes cell in the states such as West Bengal, Madhya Pradesh, Tamil Nadu, Jharkhand which have large number of hazardous wastes generating units. The SPCBs/PCCs of some states such as Haryana, Rajasthan, Odisha, Himachal Pradesh, Puducherry, Karnataka, West Bengal, Kerala and Gujarat have organised training programs for the officials and staff of the laboratory.

In Assam there is one central laboratory and four regional laboratories. It is observed that the laboratories are not equipped with manpower as well as equipments. Therefore, the state government and SPCB of Assam should take initiative to revamp the laboratory facilities manned with manpower and equipments through providing financial assistance and training programmes.

Performance of other departments

The government of Assam have not authorised their respective department of industry to ensure allocation of industrial space for recycling/pre-processing and other utilization of hazardous wastes as stipulated under Rule 5(1) of H&OWM Rules, 2016. Under Rule 5(3), it is the duty of every state that they must prepared integrated plan to submit annual report to the MoEF&CC for effective implementation of the provision of H&OWM Rules, 2016. Subsequently, the MoEF&CC have issued latter vide D.O.23/21/2018-HSM dated 18/04/2018 to the chief Secretary/Advisor to Administrator of 35 states/UTs to submit annual report with regard to action taken on

the provisions of Rules 5(1), 5(2) and 5(3) of H&OWM Rules, 2016. However no response has been received from Assam government.

It is found from the study that the status on violations reported and action taken by the SPCB of Assam is nil. The board has not filed any court case against such violators during 2017-18. It is failed to comply with the NGT order dated 30/07/2018. The CPCB has send two letters dated on 17/08/2018 and 17/10/2018 requesting the SPCB of Assam to take necessary action against the violators and send a copy of action taken on compliance of the aforesaid order. Therefore the government should be sensitized to check whether the various department or agencies performed their duties as prescribed by the Rule 5(1), 5(2) and 5(3) of the H&OWM Rules, 2016. Though the SPCB of Assam has identified the sites for common TSDF but no action plan with time target has been submitted.

The CPCB/SPCBs/PCCs should initiate capacity building programme likewise provide practical training of the manpower to the use of tools and techniques to analyze all the hazardous wastes parameters for effective governance. The MoEF&CC, CPCB, SPCB, PCC and operators of facilities shall make funds for research and encourage the academic institution/research agencies for environmental research.

On duties of the state governments

The state governments have some duties to perform and authorised their respective departments under schedule VII of H&OWM Rules, 2016. Most of the state governments/UTs such as Manipur, Meghalaya, Mizoram, Sikkim, Daman and Diu, Puducherry and Assam have not authorised their respective department of industry to

ensure allocation of industrial space for recycling/pre-processing and other utilization of hazardous wastes as stipulated under Rule 5(1) of H&OWM Rules, 2016. Though the department of industry of 3 states namely Chhattisgarh, Goa and Bihar has been authorised in this regard but no duties has been discharged by the departments as stipulated in the Rules. In this matter the government of West Bengal has played commendable job that the department has allocated 70 acres land for setting up of a recycling unit.

The state governments/UTs may also authorize the department of labour to ensure recognition and registration of worker engaging in the recycling/pre-processing and other utilization of hazardous waste for safety and health risk under Rule 5(2) of H&OWM Rules, 2016. But is found from the study that the department of labour of the states such as Delhi, Chandigarh, Himachal Pradesh, Andhra Pradesh, Chhattisgarh, Goa, and West Bengal have not been authorised under the aforesaid provision therefore they cannot take action for enforcement of any provision of H&OWM Rules.

Under Rule 5(3), it is the duty of every state that they must prepared integrated plan to submit annual report to the MoEF&CC for effective implementation of the provision of H&OWM Rules, 2016. Subsequently, the MoEF&CC have issued latter vide D.O.23/21/2018-HSM dated 18/04/2018 to the chief Secretary/Advisor to Administrator of 35 states/UTs to submit annual report with regard to action taken on the provisions of Rules 5(1), 5(2) and 5(3) of H&OWM Rules, 2016. However no response has been received from any states/UTs government.

The state/UT government has also empowered to identify and notification of sites for common TSDF, to make any decision on environmental impact assessment, to publish annual inventory of all disposal sites under Rule 21 of the H&OWM Rules, 2016. It found from the study that the environmental departments and SPCBs of only 7 states namely Kerala, Andhra Pradesh, Punjab, Telangana, Haryana, Uttarakhand and West Bengal have identified the sites for common TSDFs and operational too. But rest of the other states/UTs such as Mizoram, Meghalaya, Sikkim, Assam, Delhi, Goa, Chhattisgarh and Jammu&Kashmir have only identified the sites as per their response to the questionnaire vide letter dated 31/08/2018.

The state government, operator of a facility, occupier or any association of occupier shall responsible whether individually or jointly to identify sites for establishment of common TSDF of the hazardous and other wastes in the state under Rule 16((1) of H&OWM Rules, 2016. It is found from the study that the state of Assam do not have both common secured landfill and common incinerator. Therefore it is observed from the study that the states/UTs governments have not complied with the Rules of the H&OWM Rules, 2016. Therefore sensitized government is need of hour to perform their duties as entrusted by the Rules.