CHAPTER – VII

Ministry of Environment and Forests

7.1 Implementation of E-waste (Management and Handling) Rules, 2011 by Central Pollution Control Board

Central Pollution Control Board did not conduct assessment of quantity of e-waste being generated/processed in the country and effectively coordinate with State agencies for collection and compilation of such data. The Board also failed to implement framework for reduction of use of hazardous substances in Electrical and Electronic Equipment manufactured and imported in the country.

7.1.1 Introduction

E-waste

E-waste is defined as waste Electrical and Electronic Equipment (EEE), whole or in part or rejects from their manufacturing and repair process, which are intended to be discarded. E-waste contains useful material of economic benefit like plastics, iron, aluminium, copper, silver, gold and platinum, etc. It also contains heavy metals like lead, chromium, mercury, cadmium, etc. and other toxic substances that may cause health risks and damage to environment. Though there is no comprehensive inventory of e-waste in the country, it was estimated that the annual e-waste generation would be eight lakh tonnes as of 2012.

High rates of obsolescence of EEE coupled with increase in demand of such products, necessitate recycling of e-waste for recovery of useful material from the waste. Therefore, collection and recycling/treatment of e-waste needs to be done in an environmentally safe manner to prevent pollution due to the hazardous substances present in the waste.

E-waste

Ministry of Environment and Forests (MoEF), Government of India framed (May 2011) the E-waste (Management and Handling) Rules, 2011 (the Rules) under the Environment (Protection) Act, 1986 with an objective to regulate and channelise e-waste in the country, which otherwise were recycled in unorganised sector using unscientific methods, causing risk to human health and environment. These Rules came into effect from 1 May 2012 and were applicable to every producer[81], bulk consumer who was involved in the manufacture, sale, purchase and processing of EEE or components as specified in Schedule-I to the Rules, collection centre[82], dismantler[83] and recycler[84] of E- waste.

Central Pollution Control Board, Delhi (CPCB), an autonomous body under MoEF, was responsible for evolving guidelines for implementation of the Rules and overseeing the progress made in reduction of use of hazardous substances in EEE. Duties of CPCB as mentioned in Schedule-III of the Rules are as follows:

(i) Co-ordination with State Pollution Control Boards/Pollution Control Committees of Union Territories (SPCBs/PCCs)

(ii) Preparation of Guidelines for Environmentally Sound Management of E-waste

(iii) Conduct assessment of E-waste generation and processing

(iv) Recommend standards and specifications for processing and recycling e-waste

(v) Documentation, compilation of data on E-waste and uploading on websites of CPCB

(vi) Conducting training and awareness programmes

(vii) Submit Annual Report to the Ministry

(viii) Any other function delegated by the Ministry under these rules

(ix) Enforcement of provisions regarding reduction in use of hazardous substances in manufacture of EEE

[81] Any person who manufactures and offers to sell EEE under his own brand, offers to sell assembled EEE produced by other manufacturers, or offers to sell imported EEE.

[82] A centre established to collect e-waste.

[83] Any person/registered society/designated agency/company/association engaged in dismantling of used EEE into their components.

[84] Any person who is engaged in the recycling or reprocessing used EEE or assemblies or their component.

(xi) Set targets for compliance to the reduction in use of hazardous substance in manufacture of EEE

(xii) Incentives and certification for green design/products

State Pollution Control Boards (SPCB)/Pollution Control Committees (PCC)/Urban Local Bodies (ULBs) were given the responsibility as regulatory agencies for ensuring implementation of the E-waste (Management and Handling) Rules, 2011 in the respective States/Union Territories and Urban Local Bodies (Municipal Committee/ Council/ Corporation).

Audit was conducted to examine extent of implementation of the Rules with respect to duties assigned to CPCB as enlisted in Schedule III to the Rules during 2011-12 to 2013-14. Audit findings are organised in accordance with duties of CPCB and discussed in the succeeding paragraphs.

7.1.2 Audit findings

7.1.2.1 Co-ordination with SPCBs/PCCs

Under Schedule-III to E-waste (Management and Handling) Rules, 2011, SPCBs/PCCs of States/UTs were required to perform duties such as inventorisation of e-waste, grant and renewal of authorisation[85], registration of recyclers of e-waste, monitoring compliance of authorisation and registration conditions, maintain information on the conditions imposed for authorisation, implementation of programmes to encourage environmentally sound recycling of e-waste, taking action against violation of the Rules and any other duty delegated by MoEF. CPCB was responsible for co-ordination with SPCBs/PCCs for implementation of the Rules.

Accordingly, CPCB called for (February 2013/July 2014/March 2015) list of producers of E-waste who applied for authorisation, number of authorisations issued to producers, number of authorisations issued to collection centres, list of dismantlers/recyclers along with their capacity and contact details, status of inventory of generation of e-waste and its completion schedule, main issues affecting the implementation of the Rules, suggestions for addressing these issues and brief note on the actions taken to address violation of the Rules, if any.

As of May 7, 2015, 128 producers in 11 States/UTs, 113 collection centres in 17 States/UTs and 143 dismantlers/recyclers in 12 States were granted authorisation by respective SPCBs/PCCs. Audit observed that CPCB initiated action for collection of above mentioned basic data only in February 2013, i.e. eight months after the Rules

[85] Permission for handling, collection, reception, storage, transportation, dismantling, recycling, treatment and disposal of e-Waste granted under E-Waste Rules.

were made effective. Thereafter, it pursued the matter with SPCBs/PCCs intermittently in July 2014 and March 2015, which indicated lack of sustained action by CPCB to collect basic data regarding e-waste in the country.

While accepting that response from SPCBs/PCCs was not satisfactory, MoEF stated (July 2015) that the remaining States reported that they did not have any authorised producers, collection centres and dismantlers/recyclers while replying to Parliamentary questions.

The reply indicated that CPCB's own coordination with SPCBs/PCCs remained ineffective.

7.1.2.2 Preparation of Guidelines for environmentally sound management of E-waste

Under the Rules, CPCB was to prepare Guidelines for Environmentally Sound Management of E-waste. CPCB formulated (June 2012) Guidelines for implementation of E-waste (Management and Handling) Rules, 2011 describing the scope of the Rules as applicable to various stakeholders.

7.1.2.3 Assessment of E-waste generation and processing

CPCB was required to "conduct assessment of E-waste generation and processing" as per duties under Schedule III of the Rules. Based on a survey conducted by CPCB in 2005, it was estimated that 1.47 lakh tonnes of e-waste was being generated in the country, which was extrapolated to eight lakh tonnes by 2012. However, according to a study published (2014) by United Nations University,[86] estimated quantity of e-waste generated in India in 2014 was 16.41 lakh tonnes. Further, 10 States (Maharashtra, Tamil Nadu, Andhra Pradesh, Uttar Pradesh, West Bengal, Delhi, Karnataka, Gujarat, Madhya Pradesh and Punjab) generated 70 *per cent* of the total e-waste generated in India (as per CPCB's Guidelines for Environmentally Sound Management of E-Waste, 2008).

However, CPCB did not conduct any independent assessment of e-waste generation and processing in India after 2005. It has been seeking (February 2013/July 2014/March 2015) this information from SPCBs/PCCs. Out of 34 SPCBs/PCCs, only 18 bodies sent their annual reports in a disparate manner, which partially contained the information. However, CPCB did not, as mentioned in para 7.1.2.1, pursue with them regularly for furnishing the said information.

[86] The Global E-Waste Monitor 2014, by United Nations University – Institute for the Advanced Study of Sustainability

As of March 2015, CPCB had estimates on generation of e-waste in respect of eight[87] States/UTs and limited information on generation of e-waste in a few cities in three States[88], based on studies carried out by concerned SPCBs/PCCs (2005 to 2013). However, there was no updated information on e-waste generation in respect of the high e-waste generating States such as Tamil Nadu, Uttar Pradesh, Delhi, Karnataka and Gujarat.

Further, data contained in annual reports submitted by SPCBs/PCCs revealed that during 2012-13, 11 States/UTs collected 6,524 MT of e-waste and during 2013-14, 14 States/UTs collected 1.21 lakh MT of e-waste. In the absence of complete information on quantity of e-waste generated by these States, it was not possible for Audit to comment on the extent of e-waste being collected.

Thus, CPCB was unaware of the quantity of e-waste generated and collected in the country and consequently did not assess the scope and magnitude of e-waste management activities to be covered under the Rules.

MoEF stated (July 2015) that quantifying generation of e-waste was the responsibility of SPCBs/PCCs and CPCB was mandated to merely compile the information received from the SPCBs/PCCs.

The reply is not acceptable as SPCBs/PCCs were responsible for inventorisation of e-waste, whereas CPCB was required to conduct assessment of e-waste generation under the Rules. CPCB neither took sustained action to collect requisite information from SPCBs/PCCs nor considered conducting an independent assessment in absence of the same. The fact remained that even after three years since the E-waste (Management and Handling) Rules, 2011 became effective, CPCB had scarce information on the quantity of e-waste being generated and processed in the country.

7.1.2.4 Recommending standards and specifications for processing and recycling e-waste

As per duties listed in Schedule-III to the Rules, CPCB was required to recommend standards and specifications for processing and recycling e-waste. CPCB brought out (June 2012) Guidelines on implementation of E-waste (Management and Handling) Rules, 2011, in which regulatory and safety requirements for collection centre, dismantling and recycling facilities were described.

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[87] Assam, Chandigarh, Goa, Himachal Pradesh, Jammu and Kashmir, Maharashtra, Puducherry and Punjab.

[88] Madhya Pradesh, Meghalaya and West Bengal.

7.1.2.5 Documentation, compilation of data on E-waste and uploading on website of CPCB

Under the list of duties of CPCB in Schedule III of the Rules, CPCB was to prepare documentation, compilation of data on e-waste and upload the same on website of CPCB. CPCB could only upload the list of recyclers and dismantlers as received from SPCBs/PCCs.

7.1.2.6 Conducting training and awareness programmes

CPCB was required to conduct training and awareness programmes under the Rules. Audit observed that during the three years since implementation of E-waste (Management and Handling) Rules, 2011, no training/awareness programmes were conducted by CPCB regarding implementation of the Rules. In fact, in a feedback (November 2014) to CPCB regarding issues affecting implementation of the Rules, Punjab Pollution Control Board (PPCB) had admitted that there was lack of awareness/coordination among various stakeholders regarding treatment of e-waste.

CPCB stated (May 2015) that it had conducted two national workshops in February 2012 and May 2012. MoEF added (July 2015) that CPCB organised one training for the officials of CPCB/SPCBs/PCCs on e-waste Management in May 2014. MoEF further stated that there was no mention in the Rules about the number of awareness programmes to be conducted each year.

The reply may be viewed in light of the fact that CPCB did not organise any awareness programme to educate various stakeholders about the provisions of the Rules. Workshops were held by CPCB to discuss the proposed Guidelines for implementation of the Rules prior to its issue by CPCB.

7.1.2.7 Submission of Annual Report to the Ministry

As per Rule 15 (1) of E-waste (Management and Handling) Rules, 2011, SPCBs/PCCs were required to prepare an annual report in the format prescribed under Form 5 of the Rules, regarding the implementation of the Rules and submit the same to CPCB by 30th September every year. Similarly, as per Rule 15 (2) of E-waste Rules, CPCB was to prepare the consolidated annual report on Management of e-waste and forward it to MoEF along with its recommendations before 30th December of every year.

Although the Rules were promulgated in May 2011, CPCB took up the matter with SPCBs/PCCs for the first time in July 2014 and sought annual reports for the year 2012 and 2013. It was observed that only 15 SPCBs and three PCCs submitted annual reports for the year 2012-13 and 2013-14 in a combined way. It was also seen that

the States were not making annual reports by 30th September of each year as prescribed in the Rules and had prepared annual reports for 2012-13 and 2013-14 only after being asked by CPCB.

CPCB also submitted consolidated annual report to the Ministry only in February 2015 by consolidating the contents of the reports sent by SPCBs/PCCs for 2012-13 and 2013-14. It was also observed that Annual Reports of CPCB was without any analysis or recommendation. No further action was initiated based on the data submitted in the annual reports either by CPCB or MoEF.

It was further noticed that format of the annual report required SPCBs/PCCs to report on the category wise details of e-waste collected. However, product wise quantity of e-waste collected was not furnished by Andhra Pradesh (2012-13), Assam, Bihar, Himachal Pradesh, Tamil Nadu, Uttar Pradesh, Punjab, Chandigarh and Delhi.

Thus, mechanism of collection of data relating to e-waste through Annual Reports by SPCBs/PCCs as well as by CPCB was ineffective.

Further, the Form 5[89] sent by respective SPCBs/PCCs for the Annual Report contained information pertaining to collection only and not about generation of e-waste.

7.1.2.8 Enforcement of provisions regarding reduction in use of hazardous substances in manufacture of EEE

Rule 13 of E-waste (Management and Handling) Rules, 2011 stipulates that every producer of EEE shall ensure that new EEE does not contain hazardous substances and also prescribes maximum concentration values[90] for these substances. The rule also stipulated that imports or placement of new EEE in the market would be permitted only for those who were compliant to these provisions. Reduction of use of Hazardous Substances (RoHS) in manufactured or imported EEE were to be achieved within a period of two years from the date of commencement of the Rules i.e. by 1st May 2014. CPCB was given the responsibility of enforcing provisions of RoHS.

CPCB included (June 2012) these provisions in its Guidelines for implementation of the Rules and initiated (March 2014) an implementation framework on RoHS

[89] Form of Annual Report to be submitted by SPCBs/PCCs to CPCB.

[90] 0.1 *per cent* by weight in homogenous materials for lead, mercury, hexavalent chromium, polybrominated biphenyls or polybrominated diphenyl ethers and, 0.01 *per cent* by weight in homogenous materials for cadmium.

enforcement based on self regulation model[91]. As verification of compliance to RoHS required separate infrastructure for testing of hazardous substances and laboratory infrastructure available at CPCB was not sufficient for testing of EEE samples under RoHS compliance, CPCB proposed to enter into an MoU with Centre for Materials for Electronics Technology, Hyderabad (C-MET)[92] for a period of three years. The framework including MoU with C-MET was approved by MoEF in November 2014.

Audit observed that CPCB initiated the process of devising an implementation framework only in March 2014, two months before the date by which the RoHS standards were to be achieved. As of May 2015, CPCB had not entered into MoU with CMET and was still in the process of developing infrastructure for testing of EEE to enforce RoHS regulation. Consequently, no random verification of hazardous substances could be done by CPCB. The proposed self regulation model was also yet to be enforced.

MoEF stated (July 2015) that implementation of RoHS was a continuous process and it would take time to create facilities for sampling and analysis. It added that the proposed framework including MoU with CMET was in active stage.

The fact remained that CPCB could not implement this framework and ensure achievement of RoHS, which was to be done by May 2014 under the Rules.

7.1.2.9 Initiatives for IT industry for reducing hazardous substances

Under list of duties in Schedule III to the E-waste (Management and Handling) Rules, 2011, CPCB was also required to develop initiatives for IT industry for reducing hazardous substances. However, CPCB did not develop any initiatives for IT industry for reducing hazardous substances as of May 2015.

7.1.2.10 Setting targets for compliance to the reduction in use of hazardous substance in manufacture of EEE

As per duties prescribed under the Rules, CPCB was to set targets for compliance to reduction in use of hazardous substance in manufacture of EEE. However, as mentioned in para 7.1.2.8 above, CPCB initiated action for development of a framework for enforcing the provisions of RoHS in March 2014. As of May 2015, CPCB had not set targets for compliance to RoHS.

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[91] Self regulation model had put primary responsibility of reduction of hazardous substances on producers and included provisions such as development of a Central Registry of Producers, mechanism for self-declaration by producers on RoHS compliance, data base on various EEEs being placed in the market by producers; only random verification on RoHS was to be done by CPCB.

[92] An autonomous society under the Department of Electronics and Information Technology

MoEF stated (July 2015) that the duty of CPCB relating to hazardous substances was to fix permissible concentration levels of hazardous substances in EEE and give time frame to any defaulter producer for becoming RoHS compliant. It should not be equated to fixing targets for achieving compliance or for monitoring of compliance.

This reply is to be viewed in the light of the fact that CPCB is entrusted with the responsibility of setting such targets under the E-waste (Management and Handling) Rules, 2011.

7.1.2.11 Incentives and certification for green design/products

Under provision of E-waste (Management and Handling) Rules, 2011, CPCB was required to develop incentives and certification for green design/products. However, as of May 2015, no action was taken in this regard.

7.1.2.12 Non-implementation of Extended Producer Responsibility

Under Extended Producer Responsibility (EPR), the producer of EEE would have the responsibility of managing such equipment after its 'end of life'. Thus, as per E-waste (Management and Handling) Rules 2011, producers were responsible for their products even after the consumers discarded them and were required to collect e-waste, finance and organise a system to meet the costs involved in environmentally sound management of e-waste.

CPCB was required to set up a committee to examine the issue of fixing targets for the purpose of monitoring of EPR compliance based on the life and type of the product, usage and consumption patterns and other relevant factors and also taking into consideration the level of compliance achieved during the first two years, as per Guidelines for implementation of E-waste (Management and Handling) Rules, 2011.

Audit observed that the said committee was not constituted as of May 2015 i.e. after three years since the Rules became effective. As a result, a mechanism to monitor the compliance to EPR responsibilities of producers of EEE could not be evolved.

MoEF replied (July 2015) that due to poor compliance by producers, it was decided to amend the Rules, due to which committee was not constituted. Approval to amendments was awaited as of July 2015.

7.1.3 Amendment to E-waste (Management and Handling) Rules, 2011

MoEF held meetings (July 2013/December 2013) with various stakeholders[93] to review the status of implementation of the E-waste (Management and Handling) Rules, 2011. It was noticed that compliance to the Rules by producers and bulk consumers was not satisfactory, as there were problems in authorisation of producers from multiple SPCBs/PCCs, time taken in obtaining authorisation and registration for dismantlers and recyclers, inability of producers and bulk consumers in fulfilling their obligations under the Rules, etc. Taking cognisance of these issues, MoEF directed CPCB (December 2013) to prepare draft amendment to the Rules seeking changes such as including Micro and Small enterprises within the scope of the Rules, single authorisation for producers by CPCB in case more than one state was involved in the authorisation process, increased responsibility of producers for setting up collection centres, etc. CPCB submitted (March 2014) the draft amendment to Rules to the Ministry; its approval was awaited as of July 2015.

7.1.4 Conclusion

The E-waste (Management and Handling) Rules, 2011 were notified with the primary objective of channelising the e-waste generated in the country for environmentally sound recycling. Audit observed that even after three years since notification of the Rules, mechanism for enforcement of various provisions in the Rules was not in place. Central Pollution Control Board (CPCB), being the nodal agency responsible for overseeing the implementation of the Rules did not assess the quantity of e-waste generated in the country. It was unable to effectively coordinate with State Pollution Control Boards/Pollution Control Committees for collection and compilation of data regarding number of producers, collection centres, dismantlers and recyclers authorised in each State, which remained incomplete. Even with available data, CPCB failed to take further action or to provide recommendations as required under the Rules.

CPCB was unable to ensure compliance to reduction of hazardous substances in Electrical and Electronic Equipment (EEE) by producers, due to non-availability of requisite infrastructure for testing of such substances in EEE. Consequently, CPCB could neither develop initiatives for IT industry for achieving reduction of use of hazardous substances nor bring out incentives/certification for green design/products. CPCB also did not suggest any mechanism to monitor the compliance to Extended Producer Responsibility of producers of EEE. CPCB also failed to conduct adequate number of training and mass awareness programmes for various stakeholders for management and handling of e-waste.

[93] SPCBs, PCCs, concerned Departments/Ministries, industry associations, etc.

Thus, there is no assurance that generation and treatment of e-waste in the country has been controlled and environmental risks reduced despite introduction of E-waste (Management and Handling) Rules, 2011.

7.2 Inordinate delay in completion of pilot projects for sewage treatment

Central Pollution Control Board took up a scheme for setting up demonstration projects for treatment of sewage at four locations. After more than four years of sanction and in spite of incurring expenditure of ₹ 8.22 crore, sewage treatment could not commence at any of the four locations due to lack of planning, coordination and monitoring.

7.2.1 Background

Generation of sewage and its disposal is an important issue in urban areas. In India, Class I and Class II cities altogether generate 38,255 MLD[94] of sewage. However, treatment facility is available only for 11,787 MLD, leaving a gap of 26,468 MLD (69 *per cent*) for treatment. Domestic sewage carries pollution load in terms of Biochemical Oxygen Demand (BOD)[95], harmful bacteria, heavy metals and other toxic chemicals. Discharge of partially treated sewage in rivers causes water pollution and resultant health and environmental hazards. Untreated sewage disposal has been identified as the main reason for deteriorating water quality of rivers and accounts for 75-80 *per cent* of total water pollution in rivers. Although it is mandatory on the part of local bodies to treat wastewater before reusing or releasing it to the natural environment, most cities have inadequate sewage treatment facilities, which poses risk to health and environment.

Central Pollution Control Board (CPCB) monitors water quality of rivers. In view of prevailing situation and considering magnitude of sewage pollution, CPCB proposed to implement *in-situ* bio-remediation technology for treatment of sewage in open drains in different cities. The objective of *in-situ* sewage treatment was to treat sewage in open drains before its discharge into rivers/lakes. The process involved treatment of sewage in open drains by using a group of beneficial bacteria to break down waste without causing any release of foul odour. The technology was thought to be simple and cost effective, requiring no major modification of drain, no additional land, space for treatment facility, power or skilled manpower. The process was proposed as an intermediate solution till the requisite treatment facilities were provided.

[94] Million litres per day

[95] The amount of Oxygen consumed by micro organisms present in sewage in breaking down the waste. BOD is a measure of extent of water pollution.

Accordingly, CPCB invited (April 2010) 'Expression of Interest' for execution of a Research and Development (R&D) cum demonstration/ pilot project on `in-situ treatment of wastewater (sewage) in drains' in Delhi or any other location. The interested firms were asked to indicate their preferred drain/location for the project. During a meeting (August 2010) in MoEF it was decided that `in-situ sewage treatment' be demonstrated on drains joining river Ganga as NGRBA[96] project. Initially, seven firms responded and their proposals were sent (October 2010) to National River Conservation Directorate (NRCD), MoEF for consideration for funding under NGRBA scheme. MoEF constituted (December 2010) a committee to examine the technical, financial and implementation aspects of the proposals received from CPCB.

In the meantime, two of the seven firms were awarded (December 2010) similar projects[97] by MoEF and another firm withdrew its proposal on the ground that the drain proposed was no longer suitable due to an ongoing construction project for Kolkata Metro. The Committee constituted by MoEF recommended (January 2011) to place remaining four proposals[98] before NGRBA for consideration by its Research Advisory Committee (RAC). NGRBA recommended (February 2011) implementation of these four projects in collaboration with respective State Governments and decided that an integrated proposal be formulated by CPCB on research aspects of the bio-remediation technology. CPCB submitted (March 2011) the integrated proposal to NRCD for consideration of RAC, NGRBA.

Based on proposal received from CPCB and after review by the Committee, MoEF sanctioned (April 2011) four demonstration/pilot projects under NGRBA/ National River Conservation Plan (NRCP) at a cost of ₹ 19.84 crore for demonstration of in-situ treatment of sewage through bio-remediation by respective firms as detailed in Table 34.

[96] National Ganga River Basin Authority
[97] `In-situ treatment of sewage (wastewater) with reference to odour control'
[98] In situ treatment of sewage through bio-remediation at Budha Nala, Ludhiana; Bakarganj Nala, Patna; Mori Gate Nala, Allahabad and City Drain, Farrukhabad.

Table 34: Demonstration projects sanctioned by MoEF for demonstration of in-situ treatment of sewage through bio-remediation

S. No	Location	Sanctioned cost (₹in crore)	Project Implementing Agency	Brief description of technologies being demonstrated by the firms
1.	Budha Nala Ludhiana	15.28	Green Infrastructure, Pune	The Project was based on Green Bridge Technology[99] which uses filtration power of biologically originated cellulosic/fibrous material in combination with sand and gravel and root systems of green plants.
2.	Bakarganj Nala, Patna	2.24	US Environ Pvt Ltd, Delhi	The project was based on Eco Bio Block (EBB). EBB is made of porous volcanic rock, cement and beneficial bacteria. The blocks are laid in the drain bed.
3.	Mori Gate Nala, Allahabad	1.38	Amrit Clean Water Technologies Pvt. Ltd. Gurgaon	The project was based on Emtech[100] Technology which involves bio-augmentation of microbial groups.
4.	City Drain, Farrukhabad	0.94	Clover Organic Ltd. Dehradun	The project was based on bio- mimicry technology[101] for sewage treatment.

All these projects were sanctioned and work order accepted by respective firms in May 2011 and these were to be implemented within one year. Respective State Governments were to meet Operation and Maintenance (O&M) costs after one year of operation of the projects.

CPCB was made the nodal agency for implementation of the projects. It was to monitor progress of the projects through fortnightly progress reports to be submitted by the firms. It was also required to ensure involvement of concerned State Government and commitment towards O&M costs.

MoEF also constituted (May 2011) a committee consisting of representatives from DBT[102], MoUD[103], University of Hyderabad, besides officers from MoEF for monitoring progress of the project. Frequency of monitoring was to be decided in the first meeting of the committee.

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99 All floatable and suspended solids are trapped in this biological bridge and the turbidity of flowing water is reduced substantially. The growing green plants help in absorption of soluble substances including heavy metals. There are four treatment cells between five green bridges which are activated and provided with micro organisms at the bottom. The embankments are treated with plantation and rocks for further enhancement of treatment process, which takes care of contamination of groundwater by seepage into the surrounding drain areas.

100 In Emtech technology, bio-augmentation is done using a blend of aerobic and facultative bacteria occurring naturally, to work in low oxygen level and enhance degradation of organic matters in waste water.

101 The technology works on bio-augmentation based on self cleaning and bio-mimicry concepts. Fermented mud ball, gravel and charcoal with net are used for treatment of water courses with locally available materials.

102 Department of Bio-Technology

103 Ministry of Urban Development

7.2.2 Audit scope

Audit examined the records relating to implementation of these four projects at CPCB and MoEF. Deficiencies observed in implementation of the projects are discussed in succeeding paragraphs.

7.2.2.1 Demonstration project at Budha Nala, Ludhiana

CPCB issued (May 2011) work order for execution of project at Budha Nala, Ludhiana to Green Infrastructure Private Ltd., Pune at a cost of ₹ 15.28 crore for duration of one year. Funds were to be released in four equal instalments of ₹ 3.82 crore each. Each instalment was to be released only after receiving bank guarantee from the firm for the said amount.

The work involved construction of five green bridges at the site and providing microbial dosing in treatment cells located between the bridges. The embankments were to be treated with plantation and rocks to prevent seepage of waste water into the surrounding drain areas.

Budha Nala, Ludhiana

Although the firm accepted the work order (May 2011) with the said terms and conditions, CPCB informed (November 2011) MoEF that the firm had requested (May 2011) that funds may be released on re-imbursement basis and therefore no bank guarantee was required to be submitted by the firm. MoEF agreed (December 2011/March 2012) to revise the terms and conditions to the effect that the firm would incur expenditure up to 25 *per cent* of the work and then claim re-imbursement from CPCB. Accordingly, CPCB issued (April 2012) a revised work order. Audit also observed that there were no penal provisions in the terms and conditions of the project, for non-start/inordinate delay of work by the firm.

Although CPCB was required to ensure coordination with State Governments, the firm obtained no-objection certificate from the State Government authorities in August 2012, after lapse of 15 months from award of work order. There was further delay in construction of green bridges due to difficulty in procuring materials such as boulders from the neighbouring State and technical problems in the first bridge.

The firm submitted its first claim for payment of ₹ 4.12 crore (December 2012) to CPCB. CPCB released (July 2013) an amount of ₹ 3.26 crore after delay of nearly six months. Against the second bill of ₹ 4.63 crore submitted (December 2013) by the

firm, CPCB released ₹ 4.40 crore in three instalments in February 2014 (₹ 58 lakh), November 2014 (₹ one crore) and December 2014 (₹ 2.82 crore).

Audit observed that as of December 2013, after more than two and half years of issue of work order, only three of five bridges were completed. However, the firm took more than four years of issue of work order in respect of the fourth bridge and completed belatedly in June 2015. The fifth and final Green Bridge was still incomplete (June 2015).CPCB did not facilitate timely implementation of the project by ensuring that necessary clearances were obtained prior to award of work. Further, CPCB took nearly six months and one year for verification and release of the firm's claim for payment in respect of first and second running bill respectively. CPCB also did not release the balance amount of ₹ 22.83 lakh against second bill on account of non-receipt of funds from MoEF, delaying the project further.

Although CPCB was to monitor the project through fortnightly reports to be submitted by the firm, Audit observed that progress reports were received irregularly from the firm. However, the firm did not submit the same for January 2015 to June 2015. CPCB failed to ensure timely submission of progress reports. Audit further observed that the committee constituted by MoEF for monitoring progress of the project failed to meet even once during the course of the project. As a result, no monitoring was carried out by MoEF either.

Thus, although the location for implementing the demonstration project was identified with the involvement of State Government, failure to obtain necessary clearances in time, procedural delays, absence of penal provision for non-execution/inordinate delay of work by firm, delay in payments and lack of monitoring by CPCB/MoEF resulted in inordinate delay of more than four years as of June 2015 in implementation of the project.

MoEF stated (June 2015) that the project was delayed due to delay in obtaining No Objection Certificate (NOC) and administrative reasons. They further accepted delay in payment of one year. They also stated that the work was awarded only after obtaining the required NOC and commitment from State to the O&M cost.

The fact, however, remained that the project was inordinately delayed even after receipt of NOC (August 2012).

7.2.2.2 Demonstration project at Bakarganj Nala, Patna

CPCB issued (May 2011) work order to US Environ, Delhi for executing the demonstration project at Bakarganj Nala, Patna at a cost of ₹ 2.24 crore. Funds were to be released in four equal instalments of ₹ 56 lakh each. Each instalment was to be released after receiving bank guarantee from the firm for said amount. The firm

accepted (May 2011) the work order and submitted a Bank Guarantee for ₹ 56 lakh valid for one year.

Bakarganj Nala, Patna

CPCB received commitment of the State Government for meeting O&M costs of the project in January 2012, after seven months from award of work. Subsequently, CPCB released (December 2012) the first instalment of ₹ 56 lakh to the firm. The firm renewed (October 2012) validity of bank guarantee for another year. However, the firm was unable to obtain NOC from the State Government and requested CPCB for assistance. With the intervention of CPCB, NOC was eventually received (November 2013) from State Government but by then, validity of bank guarantee had again lapsed. As of December 2014, neither was bank guarantee renewed nor work was initiated by the firm. CPCB took no further action to get the project work commenced.

Thus, despite being the nodal agency for implementation of the project, CPCB could not ensure timely implementation by obtaining necessary clearances prior to award of work. Instead, CPCB issued work order and released the first instalment of ₹ 56 lakh to the firm without availability of clearances. Further, CPCB failed to exercise due care in releasing funds for the project. After expiry of bank guarantee on the second occasion, CPCB did not take action to get it renewed. Consequently, ₹ 56 lakh remained with the firm since December 2012 without any security, besides loss of interest of ₹ 5.60 lakh[104] on the same (January 2013 to June 2015).

Audit also observed that there were no penal provisions in the terms and conditions of the project for inordinate delay/non-execution of work by the firm.

There was no monitoring of the project by CPCB and MoEF. CPCB did not ensure that the firm submitted fortnightly progress report regularly. First progress report was received by CPCB in February 2014. Further, as mentioned in para 7.2.2.1, committee constituted by MoEF to monitor progress of the project did not meet at all.

MoEF accepted (June 2015) the fact regarding non-start of work by the firm upto March 2015. However, it reported that site cleaning work was started by the firm, as reported in first fortnightly report of April 2015.

[104] Based on SBI saving bank interest rate of four *per cent*.

7.2.2.3 Demonstration projects at Allahabad and Farrukhabad

As per the project conception, CPCB was to bear the Operation and Maintenance (O&M) costs of the bioremediation plants for one year, after which the respective State Governments were to meet the same. According to the terms of the administrative approval issued to CPCB by MoEF, CPCB was to ensure the involvement of State Governments and their commitment in respect of O&M costs. Accordingly, in a meeting held (August 2011) by MoEF to review the project, it was decided that CPCB would obtain commitment from the State Government for meeting O&M costs after one year of operation of the project.

The Uttar Pradesh State Government observed (December 2011) that O&M costs of projects to be implemented at Mori Gate, Allahabad (₹ 1.38 crore) and City drain, Farukhabad (₹ 61 lakh) were high and suggested a change of locations. Based on the suggestions of Uttar Pradesh Jal Nigam, CPCB forwarded fresh project proposals in respect of Movaiya Nala, Allahabad and Tokaghat Nala, Farukhabad at capital cost of ₹ 2.03 crore and ₹ 1.12 crore respectively to Uttar Pradesh State Government, seeking its commitment on bearing O&M costs after one year of operation. The proposed annual O&M costs for the new locations were ₹ 2.03 crore and ₹ 69 lakh respectively. However, response of State Government was not received, due to which the projects could not be initiated at any of the locations in Uttar Pradesh.

Audit observed that neither MoEF nor CPCB could obtain commitment from the State Government for bearing O&M costs of the projects prior to sanction of project, which indicated deficient planning.As a result, the demonstration project could not be set up at any location in UP.

MoEF stated (June 2015) that infrastructure requirements for the project may change from place to place depending upon the local situation which may not be fully envisaged through prior-planning, and the project could not be initiated at both locations due to non-receipt of commitment from the State Government for bearing O&M costs. CPCB further mentioned that the State Government also did not agree to demonstrate the technology.

The fact remained that the projects were sanctioned and awarded to the firms before obtaining firm commitment from State Government.

7.2.3 Conclusion

Central Pollution Control Board (CPCB) failed to plan the demonstration projects properly, as it did not ensure commitments of the concerned State Governments before awarding work to the implementing agencies. As a result, projects could not be initiated at three locations and was badly delayed at the fourth. CPCB also failed to coordinate release of funds with progress of work which resulted in blocking of funds of ₹ 56 lakh with a private firm. Monitoring of the projects by both CPCB and Ministry of Environment and Forests (MoEF) was deficient. The monitoring committee constituted by MoEF did not meet even once.

Thus, the objective of setting up demonstration projects for treatment of sewage and thereby mitigate resultant environmental and health hazards remained unachieved even after more than four years of sanction and incurring expenditure of ₹ 8.22 crore.

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