



Green Files

Newsletter on Environment audit and sustainable development issues

International Centre for Environment Audit and
Sustainable Development (iCED)



Editorial

I am happy to present 16th issue of Green Files.

Green Files is a newsletter compiled by iCED. From this volume onwards we set out to enlarge and deepen its content. This newsletter aims to share professional experience and information to enrich environmental auditors' domain knowledge.

While retaining its standard features like Results of recent environmental conferences-national & international, Snapshots of recent news on environment, Court judgements on environment issues as well as recent national audit report pertaining to environment and sustainable development, efforts are envisaged to enrich this newsletter in its forthcoming issues.

This volume features glimpses of events in iCED through "iCED News" for the first time. Coverage of an international audit report also undergoes an "approach shift". While giving the essence of one such report, an attempt is made to draw lessons for India from it.

I do hope that readers would feel a bigger connect with iCED through these changes.

Reach and readership of the newsletter is growing day by day. In this backdrop, it is important that fraternity within the Indian Audit and Accounts Department contribute articles, views and suggestions about the audit practices, audit techniques and implementation of new audit initiatives in the fields of Environment Audit and audit of Sustainable development.

We look forward to your suggestions to make Green Files more relevant, useful, and appealing. Contributions in any form but within the broad scope of the newsletter are encouraged. These can be mailed to iced@cag.gov.in

Sunil Dadhe
Director General

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I. Paris Agreement under United Nations' Framework Convention on Climate Change

The United Nations Framework Convention on Climate Change (UNFCCC) is an international environmental treaty (also known as a multilateral environmental agreement) that was opened for signature at the Earth Summit held in Rio de Janeiro in 1992 and came into force in 1994. The ultimate objective of the Convention is to "stabilise greenhouse gas concentrations in the atmosphere at a level that will prevent dangerous human interference with the climate system." It states that "such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened, and to enable economic development to proceed in a sustainable manner. The UNFCCC established a long-term objective, general principles, common and differentiated commitments, and a basic governance structure, including an annual COP. 194 countries signed the UNFCCC showing near universal agreement that there is a problem and that action is required against climate change. The treaty itself is not legally binding as it does not set mandatory limits on greenhouse gas emissions for individual countries and doesn't contain any enforcement mechanisms. After the signing of the UNFCCC treaty, Parties to the UNFCCC discussed how to achieve the treaty's aims. Discussions at conferences led to the Kyoto Protocol. Kyoto Protocol sets emissions targets for developed countries which are binding under international law. The Kyoto Protocol has had two commitment periods, the first of which lasted from 2005-2012. The second one runs from 2012-2020 and is based on the Doha

Amendment to the Protocol, which has not entered into force. US had not ratified the Kyoto Protocol, while Canada denounced it in 2012.

All States that are Parties to the Convention are represented at the COP, at which they review the implementation of the Convention and any other legal instruments that the COP adopts and take decisions necessary to promote the effective implementation of the Convention, including institutional and administrative arrangements. 21st Session of the Conference of the Parties (COP 21) to the United Nations Framework Convention on Climate Change (UNFCCC) was held from November 30th to December 12th, 2015 at Paris. The Paris Agreement marks the latest step in the evolution of the U.N. climate change regime.

The journey to 'Paris agreement' started with 1997 Kyoto Protocol which took a more "top-down" but highly differentiated approach, establishing negotiated, binding emissions targets for developed countries, and no new commitments for developing countries. Because the United States did not join, and some countries that did set no targets beyond 2012, the protocol now covers less than 15 percent of global emissions. With the 2009 Copenhagen Accord (COP 15) and 2010 Cancún Agreements (COP16), parties established a parallel "bottom-up" framework, with countries undertaking national pledges for 2020 that represent political rather than legal commitments. This approach attracted much wider participation, including, for the first time, specific mitigation pledges by developing countries. However, countries' pledges fell far short of the reductions needed to meet the goal set in Copenhagen and Cancún of keeping average warming below 2

degrees Celsius above pre-industrial levels. The negotiations toward a Paris agreement were launched with the Durban Platform for Enhanced Action adopted at COP 17 in 2011. The Durban Platform called for “a protocol, another legal instrument or an agreed outcome with legal force under the Convention applicable to all Parties,” to apply from 2020, but provided no further substantive guidance. COP 19 in Warsaw called on parties to submit “intended nationally determined contributions” (INDCs) well before the Paris conference, signalling an important bottom-up feature of the emerging agreement. Heading into Paris, more than 180 countries including India, China and USA producing more than 90 percent of global emissions had submitted INDCs, a much broader response than many had anticipated.

In broad structure, the Paris Agreement reflects a “hybrid” approach blending bottom-up flexibility, to achieve broad participation, with top-down rules, to promote accountability and ambition and is a treaty under international law, but only certain provisions are legally binding. A crosscutting issue was how to reflect the UNFCCC’s principle of “common but differentiated responsibilities and respective capabilities.” On the whole, the Paris Agreement represents a fundamental shift away from the categorical binary approach of the Kyoto Protocol towards more nuanced forms of differentiation, reflected differently in different provisions. The agreement includes references to developed and developing countries, stating in several places that the former should take the lead. But it notably makes no mention of the Annex I (developed) and non-Annex I (developing) categories contained in the

UNFCCC. Paris Agreement and the accompanying COP decision:

- Reaffirm the goal of limiting ‘global temperature increase’ well below 2⁰ C above pre-industrial levels, while urging efforts to limit the increase to 1.5⁰ C;
- Establish binding commitments by all parties to make “nationally determined contributions” (NDCs), and to pursue domestic measures aimed at achieving them;
- Commit all countries to report regularly on their emissions and “progress made in implementing and achieving” their NDCs, and to undergo international review;
- Commit all countries to submit new NDCs every five years, with the clear expectation that they will “represent a progression” beyond previous ones;
- Reaffirm the binding obligations of developed countries under the UNFCCC to support the efforts of developing countries, while for the first time encouraging voluntary contributions by developing countries too;
- Extend the current goal of mobilizing \$100 billion a year in support by 2020 through 2025, with a new, higher goal to be set for the period after 2025;

The Paris Agreement articulates two long-term emission goals: first, a peaking of emissions as soon as possible (with a recognition that it will take longer for developing countries); then, a goal of net greenhouse gas neutrality (expressed as “a balance between anthropogenic emissions by sources and removals by sinks”) in the second half of this century. The latter was an alternative to earlier terms like “decarbonisation” and “climate neutrality”.

To promote rising ambition, the agreement establishes two linked processes,

each on a five-year cycle. The first process is a “global stocktake” to assess collective progress toward meeting the agreement’s long-term goals. The first stocktake will take place in 2023. The second process is the submission by parties of new NDCs, “informed by the outcomes of the global stocktake”.

The Paris Agreement rests heavily on transparency as a means of holding countries accountable. In another move beyond bifurcation, it establishes a new transparency system with common binding commitments for all parties and “built-in flexibility” to accommodate varying national capacities. All countries are required to submit emissions inventories and the “information necessary to track progress made in implementing and achieving” their NDCs. Information reported by countries on mitigation and support will undergo “expert technical review,” and each party must participate in “a facilitative, multilateral consideration of progress” in implementing and achieving its NDC (a form of peer review).

A major priority for many developing countries was strengthening adaptation efforts under the UNFCCC. The agreement does that by:

- Establishing a global goal of “enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change”;
- Requiring all parties, “as appropriate,” to plan and implement adaptation efforts;
- Encouraging all parties to report on their adaptation efforts and/or needs;
- Committing enhanced adaptation support for developing countries; and
- Including a review of adaptation progress, and of the adequacy and effectiveness of adaptation support, in

the global stocktake to be undertaken every five years.

A new mechanism, similar to the Clean Development Mechanism under the Kyoto Protocol, enabling emission reductions in one country to be counted toward another country’s NDC. However, this agreement requires parties engaging in international emissions trading to avoid “double counting”.

The interim body established as part of Warsaw International Mechanism for Loss and Damage (COP 19) would develop approaches to help small island countries and other countries highly vulnerable to climate impacts. These provisions of agreement did not involve or provided basis for any liability or compensation but other approaches like early warning system and risk insurance would be examined.

Apart from formal negotiations, governments and many other non-state actors like cities, states, regions, companies and investors offered pledges and launched initiatives advancing climate efforts at all levels as follows:

- Collectively, developed countries pledged \$19 billion to help developing countries;
- India and France led 120 countries announced an International Solar Alliance supporting solar energy deployment in developing countries;
- More than 20 developed and developing countries launched Mission Innovation, pledging to double public investment in clean energy research and development over five years.
- Microsoft founder Bill Gates and 27 other major investors in 10 countries launched the Breakthrough Energy Coalition to steer more private capital into clean energy deployment.

- France encouraged non-state actors to demonstrate their action and support by entering pledges into the NAZCA Portal set up under the Lima-Paris Action Agenda.

The Paris Agreement which is an end result of four-year negotiating round ends the strict differentiation between developed and developing countries that characterized earlier efforts, replacing it with a common framework that commits all countries to put forward their best efforts and to strengthen them in the years ahead. The outcome of Paris Agreements have been encouraging and lauded by the whole world. The words of French President Francois Hollande are noteworthy who summed it up saying "In Paris, there have been many revolutions over the centuries. Today it is the most beautiful and the most peaceful revolution that has just been accomplished - a revolution for climate change."

The Paris Agreement will be open for signature during April 22, 2016 to April 21, 2017. In order to become a party to the agreement, a country must then express its consent to be bound through a formal process of ratification, acceptance, approval or accession. The agreement establishes a "double trigger" for entry into-force: it requires approval by at least 55 countries accounting for at least 55 percent of global greenhouse gas emissions. If states ratify quickly, these conditions could be satisfied pre-2020, allowing the COP to begin meeting as the "meeting of the Parties" to the Paris Agreement, to be known by the acronym CMA. In the meantime, pending the agreement's entry into force, a new Ad Hoc Working Group on the Paris agreement will begin meeting to consider issues requiring further rules or guidance. This new ad hoc working group will

meet for the first time when the UNFCCC subsidiary bodies convene in Bonn, Germany, on May 16-26, 2016. COP 22 is set for November 7-18, 2016, in Marrakech, Morocco.

II. Judgement of NGT on Pollution of Ganga

**(M.C. Mehta vs. Union of India & Ors.)
(Judgement of December, 2015 on O.A 200/2014)**

The Hon'ble Supreme Court of India has extended the dimension of Article 21 of the Constitution of India by declaring the right to a decent and clean environment as a Fundamental Right. The framers of the Constitution even prescribed duty upon the citizens to make every effort to keep the environment clean and to protect its rivers, water-bodies amongst other natural resources and to have compassion for the living creatures.

The river Ganga has for the people of this country great significance not only in the spiritual or mythological sense but also in material terms for it sustains millions who are settled on its bank or eke out their living by tilling lands that are fertilized by its water. It also provides life line to large number of cities which are located on its bank. It is a source of irrigation and drinking water for larger section of population in cities and villages along river Ganga. The River Ganga, a life line to the five states through which it flows, is one of the major components of economic development. Growth of the States is subjected to intolerable pollution contributed majorly by industrial untreated/treated effluent which is violative of the prescribed standards, sewage and dumping of various wastes like Municipal Solid Waste, Construction and demolition waste.

An Application vide Civil Writ Petition No. 3727 of 1985 was originally registered with the Hon’ble Supreme Court of India. In an order dated 29th October, 2014, Hon’ble Supreme Court of India transferred this case to the National Green Tribunal (the Tribunal or NGT) stating:

*We regret to say that the intervention and sustained efforts made by us over the past 30 years notwithstanding no fruitful result has been achieved so far except the shutting down of some of the polluting units. This is largely because while orders have been passed by us their implementation remains in the hands of statutory authorities including the CPCB and the State PCBs which have done practically nothing to effectuate those orders or to take independent steps that would prevent pollution in the river. A total lack of monitoring by the statutory bodies has also contributed to the current state of affairs. The report of the **Comptroller and Auditor General** to the effect is a clear indictment of the statutory authorities and those at the helm of their affairs.*

We consider it more appropriate to refer the issue relating to enforcement of the provisions of the statutes touching environment and its preservation arising out of discharge of industrial effluents into river Ganga to the National Green Tribunal. We are confident that the Tribunal which has several experts as its members and the advantage of assistance from agencies from outside will spare no efforts to effectively address all the questions arising out of industrial effluents being discharged into the river. This will include discharge not only from the grossly polluting industries referred to in the earlier part of this order but also discharge from “highly polluting units” also.

Thus the two cases, i.e., Original Application No. 10 of 2015 and Original Application No. 200 of 2014 were the lead cases before the Tribunal in relation to cleaning of river Ganga. The Original Application No. 10 of 2015 primarily related to pollution being caused by throwing of waste, particularly untreated or partially treated sewage being inducted into the river Ganga. The Original Application No. 200 of 2014 related to general cleaning of Ganga which flows nearly 2,525 Kms. in 5 different states viz. Uttarakhand, Uttar Pradesh, Jharkhand, Bihar and West Bengal.

In the above backdrop, the Tribunal decided to deal with cleaning of river Ganga in phases. It was decided to dissect the entire 2,525 Kms stretch of river Ganga into 4 different phases.

Phase	Phase 1		Phase 2	Phase 3	Phase 4
	Segment 1	Segment 2			
Downs tream Place	Haridwar	Kanpur	Eastern border of UP (Mokama Ghat)	Eastern border of Jharkhand	Bay of Bengal

From Haridwar onwards the natural flow of river Ganga reduces from 31,000 Cusecs to about 4,000 Cusecs near Kanpur. On the one hand, there is tremendous decrease in volume of natural flow of the river, while on the other, there is simultaneous increase in pollutants being put into river Ganga, primarily including sewage and trade effluents of Seriously Polluting Industries (for short, “SPI”) as well as other industries which leads to increase in pollution load tremendously.

In this judgment, the NGT dealt with the prevention and control of pollution of River Ganga in first segment of Phase-1 and restoration of the river and its bio-diversity to its pristine form. From Gaumukh to Haridwar the main source of pollution is by discharge of

untreated sewage into the river. The industrial or trade effluent discharge into River Ganga is quite minimal in this segment. However, other sources of pollution are indiscriminate dumping of construction and demolition waste, municipal solid waste and other wastes into the river directly. As River Ganga is a holy river, with religious sentiments attached to it and is even worshipped by majority of the people, therefore, another important aspect of this segment is regulation of religious activities to ensure that flow of the river is not obstructed and the holy river is not exposed to intolerable pollution from that activity.

Judgement

I. Directions in regard to Collection and Disposal of Sewage

1. All the established and to be established STPs, shall ensure that the treated sewage released from these STPs is adhering to the prescribed parameters.
2. Discharge of any sewage or any untreated effluent through drains or otherwise into the River Ganga or its tributaries in the entire Segment-A of Phase-I is prohibited. All the drains shall be tapped and the sewage from these drains would be brought to the common bio-digesters / STPs as the case may be.
3. Every effort would be made to provide a common Bio-Digester for hamlets.
4. All hydro-projects which are in operation or under construction would be directed to provide their own STP's and make them operational within 3 months from the date of pronouncement of this judgment. UKPCB shall take punitive action against the head of the department of such

projects and persons responsible for operation and maintenance of such plants if discharge is not meeting the standards.

5. Wherever there is a town which is closer to the industrial clusters, it will be ensured that the treated sewage water from the town is recycled for industrial purposes or other permissible purposes. Every effort should be made not to discharge more than 25 per cent of the total release from all the STPs into river Ganga.
6. Proper management scheme or protocol shall be prepared and notified by the State and all its agencies to ensure that the sewerage or sewage effluent collected in common septic tanks or bio-digesters, is emptied regularly and taken to the STP for appropriate treatment and its consequential release. The manure collected in the bio-digester shall be distributed free of cost to the farmers around the area.
7. Every officer and head of the department of the public authority or body responsible for maintaining and operating the STPs/Bio digesters would be personally responsible for default, if the released sewage/effluent is found to be excessive to the prescribed parameters.

II. Directions in relation to Industries

1. UKPCB shall close down all non-compliant Seriously Polluting Industries. The State Government and District Administration shall ensure that all the SPIs in relation to which UKPCB has already passed orders of closure shall also be closed forthwith.

2. In the event, any of the industries are found to be defaulting, their premises shall be sealed and electricity and water connection shall be disconnected forthwith.
3. The industries which are in the process of complying with the directions issued by UKPCB would be permitted to do the needful within three months.
4. All industries located anywhere in any part of Segment-A of Part-I would obtain consent of the Board irrespective of nature of their business and quantity and quality of discharge of their trade effluent.
5. The two existing CETPs, one at Sitarganj and other at SIDCUL, Haridwar are a matter of serious concern and solutions for their operations should be put in place by installing an independent ETP of 4 MLD at SIDCUL, Haridwar if so required.
6. Steps will be taken by the agency operating CETP as well as all concerned authorities to recycle the effluents so that least effluent is discharged into river Sukhi.
7. BHEL directed to install its own STP of 11 MLD capacity by January 2016 and should preferably achieve zero liquid discharge. The treated sewage water should be used and recycled for agriculture, horticulture or its own industrial purpose.
8. All the industries except the ones which have a dry process required to move an application, complete in all respects, to take consent of UKPCB within one month from the date of pronouncement of the Judgment.

III Directions in relation to Hotels/Dharamshalas/ Ashrams

1. All such Hotels in Rishikesh or Haridwar which are releasing their domestic waste and sewage into river Ganga or its tributaries without treatment / consent shall be directed to be shut down forthwith.
2. Ashrams and Dharamshalas discharging their sewage or domestic effluent directly into the River Ganga or its tributaries, whether or not they have their STP, would be directed to stop such discharge within 1 month from the date of issuance of the notice in this regard.
3. The ashrams / Dharamshalas which do not have their own STP would be required to establish such STP within 3 months from the date of pronouncement of this Judgment. They must discharge such effluent into drains alone that bring such effluent to the STP.
4. If any Hotel, Dharamshala or ashram violates these directions it shall be liable to pay environmental compensation for causing pollution of River Ganga at the rate of Rs. 5000 per day. The joint inspection team shall submit the inspection report to the Tribunal quarterly.

IV Directions in relation to Municipal Solid Waste

1. There shall be complete prohibition on use of plastic in all the cities / towns falling on the river Ganga and / or its tributaries. Under no circumstances procurement, storing and sale of plastic carry bags of any thickness whatsoever would be permitted w.e.f. 1st February,

2016. The defaulter would be liable to pay environmental compensation for degradation of environment and water pollution at the rate of Rs. 5000 per incident
2. The State of Uttarakhand in co-ordination with Ministry of Textile and other agencies would provide biodegradable materials including jute bags, paper glasses, tumbler and such other items.
3. The Nagar Nigam shall ensure that any kind of municipal solid waste or animal waste is not permitted to be deposited and / or thrown on the ghats and the river banks under any circumstances. A round the clock cleanliness activity shall be carried out.
4. The Nagar Nigam, UKPCB and the Authorities shall place appropriate size of dustbins near the shops, bathing ghats and roads and it would be mandatory for any person and shopkeepers to deposit the municipal solid waste into the dustbins. The waste shall be collected on daily basis and taken to the appropriate site and disposed of strictly in accordance with the Municipal Solid Wastes (Management and Handling) Rules, 2000.
5. No vehicles would be permitted to be washed within the flood plain and no toilets in that area be used by the public and no person running hotel, restaurant and shops or other commercial activity would throw any waste on the Ghats or into the river. The use of the DG sets on the ghats or the flood plain is hereby strictly prohibited.
6. The ghats to be maintained by Nagar Nigam and Police Authority properly and ensure environment hygiene and cleanliness and that no pollution is caused at the river Ganga from different activities on the Ghats.
7. Nobody shall be permitted to wash clothes, utensils or other items on the ghats of the river Ganga.
8. Nagar Nigam shall provide eco-toilets away from the flood plain of the river Ganga for use of general public. These toilets shall be cleaned and maintained in hygienic condition by the Nagar Nigam.
9. The State Government to develop and construct MSW dumping site at Sarai Village, Haridwar. Once this site is ready, the entire MSW deposit at Chandi ghat site shall be segregated, removed and deposited at the new site. The authorities concerned shall formulate a scheme and methodology for door to door collection from the bins in the respective colonies, segregation at the collection point, its transportation in covered vehicles and its disposal at the site and the Plant in accordance with the MSW Rules.
10. The Supervisory Committee constituted under this judgment to submit a report to the Tribunal for construction of MSW dumping sites and plants which would ensure that the generated waste from the entire State can be effectively collected and disposed of in accordance with MSW Rules.
11. There shall be prohibition on throwing of any municipal waste, construction and demolition and other wastes into

river Ganga and its tributaries and even on banks thereof.

12. The State Government, and its instrumentalities and all public authorities to ensure that public facilities like toilets are provided on the appropriate places in colonies abutting river Ganga. The toilets should be connected and linked to biodigesters or STPs constructed for that purpose alone.
13. The State Government, public authorities, Nigam and Municipalities shall prepare an action plan in relation to providing bio-toilets in such number which is commensurate to the floating population coming to Haridwar and different parts of Uttarakhand as pilgrims or in the festive season.
14. The authorities should identify at least temporary dumping sites in all the districts and major towns till long term solutions are in place. Such temporary sites where MSW should be dumped after segregation should not be within 500 meters distance from the end of the flood plain of the river Ganga or its Tributaries. The plastic or such other waste which can be used as a fuel should be sent to the proper plants.

V Directions in relation to Flood Plains

1. The State shall prepare and submit to the MoEF, Tourism-cum-Plain map, Flood Plain map and zoning of flood plain within 3 months from the date of pronouncement of this judgment. It shall be notified and brought in the public domain once approved by MoEF.
2. As an interim measure at least 100m from middle of the river would be treated and dealt with as 'Eco sensitive

and prohibited zone'. No activity whether permanent or temporary in nature will be permitted to be carried on in this zone including camping. The only exception would be the points for picking up and dropping the guests who are doing rafting in river Ganga.

3. The area beyond 100 meters and less than 300 meters would be treated as 'regulatory zone' in the hilly terrain, for which the State will comply with the above directions.
4. The area upto 200 meters shall be the 'prohibited area' in the plain terrain and more than 200 meters and less than 500 meters would be treated as 'regulatory zone'.
5. The State would keep in mind 1 in 25 years flood to be the criteria for declaring flood plain and the regulated activities which would be permitted in that area.
6. Any activity or construction in the regulated area afore-referred where the gradient is beyond 35° should be further checked and preferably no activity should be permitted, to prevent ecological damage and land sliding in that area.
7. In this prohibited area, no public authority or State department, including the panchayat would grant permission for any activity whatsoever, including eco-tourism except to the extent of points for pick up and dropping for river rafting.

VI Directions in relation to Mining on the River Bed

1. The river bed mining shall be carried on in a highly regulated manner and under

strict supervision of the authorities concerned.

2. No mechanised river bed mining would be permitted. No JCBs would be permitted to operate in the river bed. No suction of the minerals from the river and the river bed would be permitted by the mechanical process like suction pumps etc.
3. The regulated mining would include the seasons during which such mining is permitted and which shall be strictly adhered to.

VII Directions in relation to Bio Medical Waste

1. In absolute terms there should be no throwing of any medical, bio medical or any other waste, into the river, on the river banks. If any present hospital is found throwing such waste anywhere on land, water bodies or other places, UKPCB and the Municipal Authorities would re-cover Rs. 20,000 per violation from that person, Hospital or authorities on account of Environmental Compensation
2. The State Government to construct and establish by itself or any other appropriate method at least two more bio-medical waste and hazardous waste plants of such capacity that would meet the requirement of 708 hospitals in the State of Uttarakhand. These plants would be established at safe sites and away from beyond 1000 meters from the river / flood plain of the river Ganga.
3. All the 708 Hospitals would be served with a notice by UKPCB and the department of health of the State requiring them to ensure proper

collection, segregation and disposal of such waste in accordance with the Bio Medical Waste (Management and Handling) Rules, 1998.

VIII General Directions

1. For completion of the project and compliance of these directions, the State Government, its instrumentalities, public authorities and bodies would be entitled to invoke the Principal of 'Polluter Pays' and require the industries, hotels and Dharamshalas and even households to pay environmental compensation, and / or sewage charges in all events.
2. The Environmental Compensation payable under these directions would be directly proportionate to the discharge of the effluent from such premises. This should primarily be imposed upon industries, hotels, ashrams and dharamshalas.

Significance

The Supreme Court, in its judgement observed that to redeem Ganga of the high pollutants a concerted effort is required. The Centre, State and the citizens of the country owe a Constitutional obligation and duty to restore and rejuvenate river Ganga to its pristine past.

It was pointed out to the Tribunal that all the Authorities concerned expressed their inability to effectively control the pollution menace for one reason or the other. Somehow the authorities have not been able to implement the law and more particularly the specific directions issued by the Supreme Court and the Tribunal over the years. The CAG reports also revealed the failure and mis-management and absence of accountability. The remedial measures that are being taken

are ineffective because of ill and faulty planning and implementation.

The Tribunal noted that the Uttarakhand Government has enacted “The Uttarakhand Flood Plain Zoning Act, 2012” under which the Collector in each district is required to carry out a survey and identify flood plains for each district in respect of different River basins. There is nothing placed on record by the State of Uttarakhand to show that in pursuance of the above referred Act of 2012, they have carried out a survey and identified the flood plains for each of the rivers in the State. The legislative intent in this regard was not translated into any action. The State Government has failed despite lapse of three years in issuing requisite Notification under Section 12 of the Act of 2012. It has in fact not even carried out the appropriate survey and delineation of the flood plain. The State has failed to act with expeditiousness despite the natural calamity of 2013.

Thus, the matter required issuance of directions of diverse dimensions and of stringent character. The significance of the Judgement lies in the fact that the Tribunal took a holistic view of the problems plaguing the Ganga. Through a consultative process, the Tribunal extracted the extent and complexity of the problems. It took cognisance of the multitude of problems, the status of ongoing projects, the results from existing infrastructure, the existing Government notifications and judgements and also the lack of implementation in this regard. The Judgement and the accompanying directions addressed the multitude of problems, the manner in which specific directions were to be applied, their time-frame, the manner of funding the proposed projects and also the penalties for non-compliance.

Sources:-

http://www.greentribunal.gov.in/Writereaddata/Downloads/200-2014%28PB-I-Judg%29OA_18-12-2015.pdf

III. Critical Analysis of Municipal Solid Wastes (Management & Handling) Rules 2000 and Draft Solid Waste Management Rules, 2015

1. Background of SWM Rules 2000 and amended Rules 2015

Wastes are substances or objects, which are intended to be disposed of, or are required to be disposed by the provisions of national laws. Many items can be considered as waste like household rubbish, sewage sludge, wastes from manufacturing activities, packaging items, discarded cars, old televisions, garden waste etc., All our daily activities give rise to a large variety of different wastes arising from different sources. The rising quality of life and high rates of resource consumption patterns have had an unintended and negative impact on the environment- the generation of wastes far beyond the handling capacities of governments and agencies.

India is one of the few countries that have made constitutional provisions for protection and improvement of the environment. Article 48-A is ‘The state shall endeavour to protect and improve the environment and to safeguard the forests and wild life of the country’. The Indian constitution provides a broad framework of powers and functions in relation with maintenance of safe and healthy environment for people and other living ones. Article 243 (W) of the constitution specifies the powers, authority and responsibility of the municipalities to carry out functions that are relevant to solid waste management, public health, sanitation conservancy and protection

of environment, safeguarding interests of weaker sections and urban poverty alleviation. The Central Government can exercise the powers conferred by sections 3, 6 and 25 of the Environment (Protection) Act, 1986 for issuing rules with an objective of protection of the environment.

A public interest litigation was filed by Almitra H. Patel and another in The Supreme Court of India in the year 1996 (Special Civil Application No. 888 of 1996) against the Government of India, all state governments and several municipal authorities in the country alleging that they have failed to discharge their obligatory duty to manage municipal solid waste appropriately. The Supreme Court set up an Expert Committee, which deliberated on the issue after consulting 300 municipal authorities in class I cities and other stakeholders by holding regional workshops in Mumbai, Delhi, Chennai, and Kolkata. It submitted its report to the Supreme Court in March, 1999 making detailed recommendations, which were circulated to all the class I cities and various stakeholders through the Government of India with interim directions for implementation. To ensure compliance, the principal recommendations of the Supreme Court appointed Committee were incorporated in the Municipal Solid Waste (Management and Handling) Rules 2000 notified by the Ministry of Environment and Forest in September 2000.

In addition to the ineffective implementation there were lot of gaps in the rules and underlying principles making the rules ineffective in dealing with the municipal solid waste management in the cities of India. As observed by the Comptroller and Auditor General of India in the Performance of Management of Waste in India (Audit Report

14 of 2008) the rules could not ensure that the waste related processes were not managed effectively in Indian states. The committee formed in response to this report of the CAG of India with the task of evolving Road Map on Management of Wastes in India recommended following things amongst others in respect of solid waste management:

- i. Formalizing a policy for popularizing internationally accepted hierarchy of waste management with a specific strategy devised for India
- ii. Promulgating laws / rules for the management of major kinds of waste including construction & demolition waste, end of life vehicles, packaging waste, mining waste, agriculture waste and e-waste
- iii. Devising and implementing disincentives and penalty for violation of the rules
- iv. The Municipal Solid Waste (Management and Handling) Rules, 2000 needs to be amended to incorporate waste reducing, reusing and recycling methods and strategies for achieving sustainable waste management while setting targets and timelines for achieving reduction in generation of waste.
- v. Segregation of wastes must be at the level of residential / institutional / Government Departments so as to facilitate door - to - door collection of segregated waste. The inorganic / non-biodegradable waste should be channelized through the informal sector workers like door-to-door collection workers, SHGs, waste worker associations and others to registered recyclers for recycling and only the remaining waste, which cannot be recycled should be taken to sanitary landfills by the registered recyclers or the municipality

The Government of India has now decided to supersede the existing MSW Rules and replace them with more comprehensive Solid Waste Management (SWM) Rules, 2015, fixing accountability among various stakeholders. After the earlier draft of 2013 facing the Karnataka High Court's stay order for being "regressive", the Union Ministry of Environment, Forests and Climate Change (MoEFCC) has finally released the Draft Solid Waste Management Rules, 2015. The new rules are going to replace the Municipal Solid Waste (Management and Handling) Rules, 2000. The guidelines and provisions delivered in the same are expected to be dealing with the immediate needs of the sector for cleaner cities of India.

2. Main provisions of MSWM Rules 2000

These rules are applied to every municipal authority responsible for collection, segregation, storage, transportation, processing and disposal of municipal solid waste.

As per these Rules every municipal authority shall, within the territorial area of the municipality, be responsible for the implementation of these rules and for any infrastructure development for collection, storage, segregation, transportation, processing and disposal of municipal solid waste. The State Pollution Control Board was given responsibility for granting authorisation for setting up waste disposal facilities and monitoring to ensure that disposal of municipal solid waste meets the compliance criteria set out by the Central Pollution Control Board in the rule.

According to Rule 4, every municipal authority shall, within the territorial area of the municipality, be responsible for the implementation of the provisions of these

rules, and for any infrastructure development for collection, storage, segregation, transportation, processing and disposal of municipal solid wastes. In addition, the municipal authority or an operator of a facility had to make an application for the grant of authorisation for setting up waste processing and disposal facility including landfills from PCB of the state. According to Rule 5, the state government shall have complete responsibility for the enforcement of the provisions of these rules. According to Rule 6, PCB of a state shall be responsible for monitoring compliance and issuing authorisations for waste processing and disposal facilities. Thus, the rules only state the specific action to be taken by municipalities and PCBs but do not lay down specific action to be taken by the state governments. According to the rules, the state government shall be responsible only for the enforcement of the provisions of these rules. Thus, the role of the state government in planning and setting up of waste processing and disposal facilities was negligible and as such, the state government cannot be held responsible if municipalities do not have a waste management plan in place or if municipalities do not set up municipal solid waste management systems.

The rules in themselves had prescribed an implementation schedule according to which major steps in the direction of management of MSW were to be taken by all the concerned governments and authorities within the laid down timeframe as in Schedule I according to which waste processing and disposal facilities were to be put in place by the end of year 2003.

3. Critical Analysis of MSWM Rules 2000 and proposed SWM Rules 2015

The MSWM Rules 2000 provided for the overall responsibility of implementation of rules on the Secretary, Urban Development Department (Metropolitan cities) and District Magistrates / Deputy Commissioners (in districts) but there was no specific role assigned to the states and the main role was only with the municipal authorities. State governments could make waste segregation mandatory and the municipality could be authorized to levy fines if segregated waste is not made available to the municipality for collection.

As per the observations in the Audit Report earlier there were no strategies to reduce municipal solid waste which are vital in reducing the generation of this wastes. Thus, waste reduction, recycling and reuse strategies which are beginning of the pipe solution to the issue of waste management and which could result in lessening the amount of waste for final disposal were not adopted. The polluters were not being effectively held responsible for unsafe disposal, thereby creating no deterrence for non-implementation of the rules. There was no clear identification of bodies which would be responsible for the implementation of the waste management rules relating to municipal solid waste and could play other complimentary role. There was no legal recognition to the informal sector systems of collection and recycling of various materials. The new rules now have accommodated these aspects in its draft. The important features of the new proposed rules are as mentioned below:

Important stakeholders identified

The functions of MoEFCC, Ministry of Urban Development, Ministry of Chemicals

and Fertilizers, Central Pollution Control Board, State Pollution Control Boards, Pollution Control Committees for Union Territories, municipal administration, state governments and urban local bodies have been aptly outlined. The duties of these stakeholders are elaborated to greater extent in the new rules.

The 2015 draft rules have also broadened the jurisdiction from mere cities to cover even Census towns (areas that have acquired urban character over the years, but still have not been able to make it to the list of notified urban settlements), areas under the Indian Railways, industrial townships, cantonments and Special Economic Zones (SEZs). Citizens will also be made responsible for waste management. While earlier no accountability was fixed on waste generators, now citizens and all those generating waste will be held responsible. The generator will not be allowed to litter, bury or burn waste and will have to segregate at source and separately store various wastes. Generators will also have to pay user fees for the sustainability of service. If citizens don't comply, municipalities may impose fines.

Segregation of waste

Construction and Demolition waste is mandated to be converted into bricks, paver blocks, building material, etc. The new chapter on Construction and Demolition waste prescribes the responsibility of generators, ULBs and standards for recycled products. At least 90 percent of waste is expected to be reduced through recycling and processing. The rules also emphasise on segregation at source by the waste generator into four categories viz. bio degradable, recyclable / combustible, domestic hazardous and inert solid wastes. The sanitary napkins and domestic hazardous

materials would now be recognised as different waste streams.

Informal sectors acknowledged

Waste management also means dealing with the kabadiwalas (scrap dealers) for selling old newspapers, magazines and other scrap items. This also takes into account waste pickers who visit us daily for collecting garbage. This is the informal sector that helps the municipality to get rid of huge amounts of waste by feeding them to the recycling industry. While waste-pickers do charge a meagre amount of money by the end of the month, they also help clean up our homes and cities without putting any financial burden on the municipality. The rules have envisaged MRFs as temporary storage depots of non-compostable waste to facilitate segregation and recovery by waste pickers before it is disposed of. The rules have for the first time recognised the contribution made by the informal sector by allowing them to collect waste from material recovery facilities (MRFs). This should be a good attempt to integrate the informal as well as formal systems in a positive manner.

Material Recovery and Waste to Energy

Under the new rules, all recyclables are to be retrieved from sources of waste generation or at material recovery facilities (MRFs) to conserve natural resources. Green technologies such as bio-methanation and composting are mandated to process bio-degradable matter whereas waste to energy technologies is only recommended to harness energy from non-recyclable high calorific value wastes. The rules ensure that after collection and storing domestic, institutional and market waste, it will be taken directly to the processing facility through a material recovery facility. This waste will not be mixed with

street waste. Stress has been laid on minimizing the waste going to a landfill and setting up of sanitary landfills for residual waste. Re-using discarded goods without reprocessing or remanufacture is given priority even over recycling. The draft has also added the schedule on specifications for waste incineration.

Emphasis on user fee

The financial sustainability for rendering waste management services has been a concern for long time. The new rules emphasise on charging user fees from waste generator in a bid to build a financially sustainable waste management system. However, it is not clear if the user fee will be based on the quantity or type of waste that generators produce. But this may be addressed in the municipal byelaws that every city is now required to devise.

Training stakeholders

A lot of times, rules have emphasised on training of government officials and capacity building of waste generators as mandatory to ensure that every stakeholder is aware of his or her duties and responsibilities. After all, the rules of 2000 served no purpose by mandating waste segregation while neglecting the fact that waste generators lacked the sense of what to segregate and how to do it.

Decentralised treatment options introduced

The earlier rules relied on costly centralised facilities for treating and disposing municipal wastes while approximately 50 per cent of it can be easily turned into compost at the local level. The draft rules have made the much needed provision for providing incentives to decentralised waste treatment facilities.

The above analysis shows that lot of concerns raised by the Comptroller and Auditor General of India are likely to be redressed and the new rules would bring in lot of progressive things. However, the implementation of these rules in letter and spirit would be challenging for the multitude of agencies. This would also pose a challenge to the auditors of the Comptroller and Auditor General of India. They have to gear up for audit of the sector at the next level.

IV. Snapshots: Environment news

HPCL gets environmental clearance for Rs 18400 crore vizag refinery expansion.

Hindustan Petroleum Corp Ltd (HPCL) the state run downstream petroleum company has received the environmental clearance to expand its refinery at Visakhapatnam in Andhra Pradesh from 8.33 million tonne per annum (MTPA) to 15.0 MTPA.

The Expert Appraisal Committee (EAC), under the Ministry of Environment and Forests (MoEF), in its meeting held in December 2015 cleared the Rs 18,400 crore expansion plan which was earlier rejected in 2013, citing moratorium on industrial expansion in some of parts of Visakhapatnam. The EAC stated that issues were satisfactorily been responded by the project proponent and incorporated in the final EIA-EMP report. The committee further added, "After detailed deliberations, the committee recommended the project for environmental clearance and stipulated... specific conditions along with other environmental conditions while considering accord of environmental clearance."

<http://www.dnaindia.com/money/report-hpcl-gets-environmental-clearance-for-rs-18400-crore-vizag-refinery-expansion-2166898>

Green light for Rs. 5,000 crore sop for rooftop solar power

The Cabinet Committee on Economic Affairs on 30.12.2015 approved an increase in the budget for implementation of grid-connected solar rooftop systems to Rs.5,000 crore from Rs.600 crore up to the financial year 2019-2020.

This will support installation of 4,200 MW solar rooftop systems in the country in next five years, according to an official statement.

The capital subsidy of 30 per cent will be provided for general category States and Union Territories and 70 per cent for special category States, including Uttarakhand, Himachal Pradesh, Jammu & Kashmir, Lakshadweep, Andaman & Nicobar Islands and those in the North-East.

<http://www.thehindu.com/business/Industry/green-light-for-rs-5000-crore-sop-for-rooftop-solar-power/article8045989.ece>

MoU between India and Germany for Solar Energy

The Union Cabinet, chaired by the Prime Minister Shri Narendra Modi, has approved a Memorandum of Understanding (MoU), which has been signed in October, 2015, between Indian and Germany, to expand bilateral development cooperation in the field of Solar Energy by increasing use of solar energy in India through technical as well as financial cooperation.

The MoU will help in strengthening bilateral cooperation between the two countries. Under the agreement, Germany would provide concessional loans in the range of one billion Euros over the next five years through Kreditanstalt fur Wiederaufbau (KfW). The funds of KfW will also be utilized for providing soft loans to the end-users through

partner banks. The MoU would lead to - i. Cooperation in the field of solar rooftops; ii. The development of solar parks or solar zones (if possible in close proximity to the Green Energy Corridors financed by KfW under Indo-German Financial Cooperation) and iii. Solar off-grid applications to improve the access to clean and sustainable energy.

The Government of India has also signed MOUs with Governments of Belgium and Mozambique.

Government of India Announces Formation of Indian Resource Panel

Government of India has announced the formation of Indian Resource Panel (InRP) on Resource Efficiency here today. The Indian Resource Panel (InRP) comprises ten members which include former Secretaries of the MoEFCC, experts from other institutions and civil society. MoEFCC will partner with other relevant ministries, private and public enterprises towards creation of a facilitative environment for recycling to promote sustainability and decouple growth from environment degradation. He also highlighted that India can hope to recover over 1.5 million tons of steel scrap, 180,000 tons of aluminium scrap and 75,000 tons each of recoverable plastic and rubber from scrapped automobiles by the year 2020. With a growing economy, India is expected to have the world's third largest consumer group by the year 2020, with a consumption share of 13%. With rising consumption levels, India is already facing supply constraints and import dependence of key materials in certain sectors.

Environment Minister Releases India State of Forest Report 2015

The Government of India recently released **India State of Forest Report**

2015 according to which India's forest and tree cover has increased by 5, 081 sq km. While the total forest cover of the country has increased by 3, 775 sq km, the tree cover has gone up by 1, 306 sq km. According to the India State of Forest Report (ISFR) 2015 released, the total forest and tree cover is 79.42 million hectare, which is 24.16 percent of the total geographical area. The total carbon stock in the country's forest is estimated to be 7, 044 million tonnes, an increase of 103 million tonnes, which is an increase of 1.48 in percentage terms over the previous assessments.

Upscaling Of Renewable Energy Targets

The Government has up-scaled the target of renewable energy capacity to **175 GW by the year 2022** which includes 100 GW from solar, 60 GW from wind, 10 GW from bio-power and 5 GW from small hydro-power. **Stepping up capacity target** under the Jawaharlal Nehru National Solar Mission (JNNSM) by five times now India is aiming to generate reaching 1,00,000 MW solar power by 2022. The target will principally comprise of 40 GW Rooftop and 60 GW through Large and Medium Scale Grid Connected Solar Power Projects. With this ambitious target, India will become one of the largest Green Energy producers in the world, surpassing several developed countries. The total investment in setting up 100 GW will be around Rs. 6,00,000 crore.

International Solar Alliance

Prime Minister of India launched an International Solar Alliance (ISA) at the CoP21 Climate Conference in Paris on 30th November as a special platform for mutual cooperation among 121 solar resource rich countries lying fully or partially between Tropic of Cancer and

Tropic of Capricorn. The alliance is dedicated to address special energy needs of ISA member countries. The new body of Secretariat will be hosted by Government of India. The Centre will provide land and \$30 million to form a secretariat for the Alliance, and also support it for five years. The participants, mostly in Latin America and Africa but also including the US, China, and France, would work together to increase solar capacity across emerging markets.

Madhya Pradesh 'bird areas' rise to 19

Two new important bird areas (IBAs) — Sirpur Lake in Indore and Pachmarhi Biosphere Reserve — have been added to the existing list of IBAs in Madhya Pradesh. Currently, there are 17 IBAs in the state that will go up to 19 when the new list is out.

The new IBAs will feature in soon-to-be published 'IBAs in India' book by conservation society Bombay Natural History Society (BNHS). Important bird area (IBA) is an area recognised as being globally important habitat for 'conservation of bird' population.

<http://timesofindia.indiatimes.com/city/bhopal/MP-bird-areas-rise-to-19/articleshow/49727949.cms>

NGT warns Ghaziabad authority over Dadri wetlands

As Greater Noida's Dadri wetlands, home to nearly 200 species of rare and migratory birds continues to shrink, the National Green Tribunal has warned the Ghaziabad Development Authority (GDA) of coercive action and attachment of property if it fails to identify officials who gave a go-ahead to various constructions in the wetland area.

The Tribunal also sought to know what was the area of the wetland when plans for the projects were submitted to the GDA for approval and on what basis the Authority

approved laying of roads inside the ecologically sensitive area.

Environmental activists Akash Vashishtha and Vikrant Tongad claimed the wetlands have shrunk from 68 hectares to 30.6 hectares.

<http://www.thehindu.com/news/national/other-states/ngt-warns-ghaziabad-authority-over-dadri-wetlands/article7881879.ece>

Swachh Mission: 75 Cities to be ranked on Cleanliness

Seventy five major cities in the country will be ranked basing on sanitation and hygiene conditions there. The ranking will come after more than a year of the launch of Swachh Bharat Mission in October last year.

The Union ministry of urban development has commissioned a survey, Swachh Survekshan, to assess clealiness in cities based on the parameters. The survey, to be conducted in January, will be carried out by Quality Council of India.

General public will have a major say in the survey and cities will be given ranks based on the examination.

<http://www.newindianexpress.com/cities/hyderabad/Swachh-Mission-75-Cities-to-be-Ranked-on-Cleanliness/2015/12/31/article3204508.ece>

V. News from iCED

During October to December 2015, iCED



organized some important training programs

and witnessed visits of members of senior management from IA&AD. A 15 day International Training Programme on “Introduction to Environmental Auditing” was organised from 16th to 30th November 2015. 22 participants from 11 countries including Bhutan, Federated States of Micronesia, India, Nauru, Oman, Saudi Arabia, Sudan, Tanzania, Senegal, Thailand and Zambia attended this program. Training programme was inaugurated by Ms. Suman Saxena, Dy. C&AG on 17th November, 2015. Comptroller and Auditor General of India addressed the Valediction ceremony on 30th November 2015 and distributed certificates to participants. Speaking at the ceremony Comptroller and



Auditor General of India said, *“I feel that global SAI community shares the responsibility of ensuring accountability in implementation of the agreed agenda (Addis Ababa Action Agenda). This is a big responsibility. We need to prepare for improving effectiveness of our oversight. Issues in Environment audit are complex, inter-related and cross-boundary. Public auditors must perfect their professional judgment by upgrading skills and sharing knowledge to fulfil expectations from them in auditing efforts to conserve environment. This would make us active participants in the challenging journey of mankind”.*

Capacity building programs on “Review of Supreme Audit Institutions (SAI) Performance Measurement Framework (PMF)” and “Review of ISSAI Compliance Assessment Tool (iCAT)” under IDI’s bilateral support program for officers from Supreme Audit Office, Afghanistan were held at iCED from 30th November to 11th December, 2015 at iCED. 12 participants from SAO, Afghanistan attended



the abovementioned training programs. Trainers included Shri Praveer Kumar from SAI, India; Shri Shourjo Chatterjee from IDI/ SAI, India; Ms. Farmeem Mowla from SAI, Bangladesh; Shri Ibrahim Aiman from SAI, Maldives; Shri Karma Tenzin from IDI/ SAI, Bhutan; Ms. Yngvild Herje Arnesen from IDI / SAI, Norway and Shri Chandra Kanta Bhandari from SAI, Nepal.

A 20 days Bilateral Training Program on “Environment Audit” was also conducted for 20 officers from SAI, Bangladesh from 02 - 21



December 2015 at iCED. Apart from classroom sessions study trips were also organized for the participants to community driven natural resource management at Laporiya village by Gram Vikas Navyuvak Mandal, Laporiya (GVNML); visit to Anasagar Lake at Ajmer, Rajasthan; Gir Forest, Gujarat; salinity ingress site at Gujarat; Central Water and Power Research Station (CWPRS), Pune and Municipal Corporation of Greater Mumbai, Mumbai.

Members of the 6th Indo - China Young



Auditors' Forum visited iCED from 06 - 09 December 2015. Ten officers from SAI of China and ten officers from the SAI of India participated in this event. Shri Jahangir Inamdar, Director (T&R), iCED briefed them about the activities and achievements of iCED as well as green features of iCED campus.

VI. State in Focus: Tamil Nadu

Tamil Nadu is eleventh largest state in India covering an area of 1,30,058 km². (4 percent of India). It is bordered by Kerala to the west, Karnataka to the northwest, Andhra Pradesh to the north, the Bay of Bengal to the east and the Indian Ocean to the south. The southernmost tip of the Indian Peninsula i.e. Cape Comorin (Kanyakumari) which is the meeting point of the Arabian Sea, the Bay of Bengal, and the Indian Ocean is located in the state. The state has always been in the

centrestage of country's economic, cultural, historical and political activities.

(1) Environment Scenario

(a) Forests

According to State of Forest Report 2013 by the Forest Survey of India, the total forest cover of the State is 23,844 km² constituting 18.33 % of geographical area. The forest cover is 2.95 % of the country's forest area. The state has 2,948 km² of very dense forests, 10,199 km² of moderately dense forest and 10,697 km² of open forests. TN ranks 11th among the Indian States and Union Territories with reference to the total forest cover. According to the National Forest Policy, on an average, a region should have 33 percent of the total geographical area under forest. The forest cover should be 60 percent of total area or more for hills and not less than 20 percent of the total area in plains.

(Source: http://www.forests.tn.nic.in/ForestAtGlance/for-estatglance_home.html)

(b) Biodiversity

There are 15 wildlife sanctuaries over 6,06,386.84 Ha and 15 bird sanctuaries over 17,666.15 Ha, 5 National Parks over 82,763 Ha, 4 Tiger Reserves, 4 Elephant Reserves and 3 Biosphere Reserves for in situ conservation of wild flora and fauna.

Floral Diversity:

The Angiosperm diversity of India includes 17,672 species. With 5640 species, Tamil Nadu ranks 1st among all the States in the Country. This includes 533 endemic species, 230 red-listed species, 1559 species of medicinal plants and 260 species of wild relatives of cultivated plant. The Gymnosperm diversity of the country is 64 species of which Tamil Nadu has 4 species of indigenous Gymnosperms and about 60 introduced species. The Pteridophytes diversity of India includes 1022 species of which Tamil Nadu has

about 184 species. Tamil Nadu wild plant diversity also includes vast number of Bryophytes, Likens, Fungi, Algae and Bacteria.

Faunal Diversity:

The faunal diversity of Tamil Nadu includes 165 species of fresh water Pisces, 76 species of Amphibians, 177 species of reptiles, 454 species of birds and 187 species of mammals. According to the CAMP reports the red-listed species include 126 species of Pisces, 56 species of Amphibians, 77 species of reptiles, 32 species of birds and 40 species of mammals. The endemic fauna includes 36 species of Amphibians, 63 species of reptiles, 17 species of birds and 24 species of mammals.

Schedule ¹ I animals	22 species of mammals, 42 species of birds and 9 species of reptiles
Schedule II animals	13 species of mammals
Schedule III animals	5 species of mammals
Schedule IV animals	5 species of mammals, 367 species of birds, 109 species of reptiles and 23 species of Amphibians
Schedule V animals	13 species of mammals and 1 species of birds

Degradation of forests, the habitats of wildlife, fragmentation, overgrazing by domestic cattle, forest fires, poaching and killing of animals due to man-animal conflict are the main threats wildlife population in Tamil Nadu facing recently. People’s involvement and support is absolutely essential to make the wildlife conservation a success in the State. Man-

¹ The Wildlife Protection Act, 1972 Act provides for the protection of wild animals, birds and plants. It has six schedules which give varying degrees of protection. Schedule I and part II of Schedule II provide absolute protection - offences under these are prescribed the highest penalties. Species listed in Schedule III and Schedule IV are also protected, but the penalties are much lower. Schedule V includes the animals which may be hunted. The plants in Schedule VI are prohibited from cultivation and planting.

animal conflict due to clash of interest is taking a serious and mammoth proportion in and around the protected areas and needs special attention and care of all concerned.

(Source:http://www.forests.tn.nic.in/WildBiodiversity/wildbiodiversity_home.html)

(c) Wetlands

The wetlands in Tamil Nadu comprise lakes, ponds, reservoirs and seasonally waterlogged areas. It may be noted that the land use statistics of the state does not indicate wetlands which are possibly classified under some other categories. Studies by SACON show that the wetland area of the state was 1.24% of the total area in 1991. The total number of wetlands of the size 56.25 ha and above for the whole state was estimated at 1,175 covering an area of 1,615.12 km².

Ecosystem services offered by wetlands include floodwater storage and control, recharge of aquifers, treatment of waste water and pollution abatement, general water quality improvement, habitats for fish, wildlife and several other animals and plant species, and biological productivity. In addition, wetlands are of high aesthetic and heritage value providing opportunities for recreation, research, and education.

Major direct threats for inland wetlands are infrastructure development (dams, dykes, road, residential and commercial buildings), land reclamation and over-harvesting. Major indirect ones are aquaculture, agriculture, reduced water flow, depletion of ground and surface water supplies, introduction of invasive alien species, and organic and inorganic pollutants.

source:http://tnenvis.nic.in/tnenvis_old/PDF/WET.pdf

(d) Hazardous Waste management

TNPCCB has taken initiatives for developing the three sites in Tamil Nadu initially viz. Gummidipoondi in Thiruvallur District, Nallur Village in Karur District and Maithigiri Village in Tiruppur District. The facilitator for all three sites is M/s Tamilnadu Waste Management Ltd (M/s Ramky Agencies, Hyderabad). A status detail of these sites is as under:

	Gummidipoondi	Tiruppur	Karur
Area of the TSDF (acres)	66	3.09	64.5
Designed capacity (Tons)	3,00,000	1,00,995	2,07,400
Land fill generation capacity (Tons/yr)	1 Lakh Ton/yr	Accumulated Qty.58212 Tons Present generation 7840	Accumulated Qty.- 28000Tons Present generation 5120
Incineration	Quantity – 3364 T/A Capacity – 1 T/hr.	-	-
Life span of each Facility	25 years	3.8 years	20 years
Indl. Estate which falls under the TSDF	SIPCOT Ind. Complex Gummidipoondi & industries location in Chennai, Thiruvallur & Kancheepuram District	CETP & ETP Solid waste generated only from Textile & dyeing units.	CETP & ETP Solid waste generated only from Textile & dyeing units.
Status	Commissioned site notified Consent to operate authorization issued.	Land fill site has been notified & Consent to Establishment issued Work to be started.	Land fill site has been notified and Consent to Establishment issued Work to be started.

(Source:<http://www.tnpcb.gov.in/activities.asp?src=tsdf.html>,
<http://www.environment.tn.nic.in/SoE/images/WasteManagement.pdf>)

Biomedical waste management

Government of India have notified the Bio Medical Waste (Management and Handling) Rules, 1996 as amended in 2000

under Environment (Protection) Act, 1986. The Tamil Nadu Pollution Control Board enforces these rules. The TNPCCB has inventoried Government Hospitals and private hospitals. The treatment of biomedical waste requires broadly the segregation of wastes into infectious, non-infectious and sharps, As per the Government of India directions, infectious wastes will have to be autoclaved and non-chlorinated wastes and body parts alone can be incinerated. 11 sites have been identified in the private sector health care units to establish common facility in the State. The Board has issued authorization to all the facilities.

According to a CPCB report, in 2009, 21418 kg/day of biomedical waste was generated (2009) out of which only 100% were getting properly treated. There were approximately 3569 health care facilities in the state with 1,18,504 beds. Ten Common Bio-Medical Treatment Plants were operational and were being utilized by all health care facilities.

(Source:<http://www.environment.tn.nic.in/SoE/images/WasteManagement.pdf>,
<http://www.cpcb.nic.in/wast/biomedicalwast/StatusBioMedicalWaste2009.pdf>)

(e) Water issues

Tamil Nadu is predominantly a shield area with 73% of the area covered under hard crystalline formations while the remaining 27% comprises of unconsolidated sedimentary formations. As far as ground water resource is concerned scarcity is the major problem in hard rock environment while salinity is the problem in sedimentary areas.

Tamil Nadu is a state with limited water resources and the rainfall in the state is seasonal. The annual average rainfall in the state is 970 mm. Approximately 33 % of this is from the southwest monsoon and 48 % from the northeast monsoon. The total surface

water potential of the river basins of Tamil Nadu is assessed as 24160 MCM (853 TMC). The average Run off (surplus flow) to the sea from the 17 Basins of Tamil Nadu State is computed as 177.12 TMC.

Agriculture is a major sector of the State's economy. Besides meeting the growing demand for food, it is the sector from which the majority of the people earn their livelihood. Of the net area sown only 46% of the area is under irrigation. The rest of the area depends only on rainfall. Productive land is being continually lost on the urban periphery due to urban development and industrialization. Because of the rapid urbanization and high settlement densities, the choice of expanding the irrigated area is reducing rapidly. The next but important constraint is water.

Water availability is a pre - requisite for food security and water now is becoming a scarce commodity. The other sectors like industries, hydro - power, domestic, livestock and environment need increasing share of water. The following table depicts the gap between the demand vs availability.

Description	Supply/Demand in TMC
Total Assessed water Resources	1587.00
Drinking water demand	51.40
Irrigation demand	1766.00
Industries, Power, Live stock	77.40
Total Demand	1894.80
Gap (Demand – Availability)	307.80

The challenge is how best this gap could be bridged by reducing the demand or by efficient water management.

(Source:http://www.twadboard.gov.in/twad/tamilnad_u.aspx)

(f) Surface water pollution

The present capacity of the treatment plants in Chennai is 486 MLD. Due to the enhancement of capacity of the 28 sewage pumping stations and construction of 3 new pumping stations, the pumping capacity has been increased from 440 MLD to 575 MLD. The capacity of the sewerage treatment plants has been increased from 222 MLD to 486 MLD and the sewage overflow and untreated sewage entering the waterways have been reduced. About 36 MLD of secondary treated sewage is being supplied to CPCL and MFL besides 5 MLD of raw sewage to GMR Vasavi Power Corporation.

Acute Diarrheal Diseases is one of the main Diseases arising due to Contaminated Water. Pathogens such as *E. coli* are the key sources of contamination. Cholera is caused due to Faecal Contamination of Water, which predominantly arises from the passing of Untreated Sewage into the Water Bodies.

There is water pollution in various districts in the State. Action should be initiated to prevent and control pollution in the districts that are prone to receive Pollution load on account of Untreated Industrial Waste Water and Municipal Sewage. Besides this Non- Point sources of pollution due to Agricultural run-off also has to be contained to protect the ground and surface water bodies.

(Source:<http://tnenvis.nic.in/Water%20Pollution%2023-04-2014%20final.pdf>)

(g) Ground water pollution

Every District in Tamil Nadu has been classified based on Ground Water Abstraction. It is classified into different blocks based on the level of Ground Water. The ground water potential of different Blocks are:

Categorisation of blocks	No. of blocks
Over exploited (>100%)	142
Critical (90-100%)	33
Semi-critical (70-90%)	57
Safe (<70%)	145
Saline blocks	8
Total	385

Theni District is the highest in terms of Fluoride Contamination Levels with 8.37 % of the samples being contaminated.

The districts of Tiruppur and Erode have high levels of Nitrate Contamination; this is due to the presence of Many Red Category Industries.

The district of Nagapattinam is highly contaminated with Iron at 12.59 %.

(Source: <http://tnenvis.nic.in/Water%20Pollution%2023-04-2014%20final.pdf>)

(h) Air Pollution

Growing air pollution has emerged as a serious concern in the cities, with vehicular emission and dust contributing a major share of the deteriorating air quality. Central Pollution Control Board initiated National Ambient Air Quality Monitoring (NAAQM) programme in the year 1984 with only seven monitoring stations in the country. Further, it has been strengthened by increasing the number of monitoring stations with 16 monitoring stations in Tamil Nadu.

City	Monitoring station
Chennai	6
Tuticorin	3
Coimbatore	3
Madurai	3
Salem	1

The air quality in Chennai city has been monitored over many years by TNPCB as well as independent academic institutes like IIT Madras. During these studies the levels of the

gaseous pollutants NO_x, SO_x and the levels of particulate matter PM₁₀ have been recorded. During festivals such as Bogi (before Pongal or Makara Sankranthi in mid January) there is a tradition of burning old clothes and tyres and tubes. This gives rise to increase in the pollution levels during this period. During the other major festival of Diwali it is a tradition to burst crackers. This again increases the emissions of toxic gases and here again the pollution level in the atmosphere is expected to be high during these periods. The TNPCB has been monitoring levels of various gases in many locations within in the city during these festivals. The stacks in the industrial areas have been monitored for total emission as well, since they fall under the preview of TNPCB.

Analysis of last ten years air quality data of Chennai shows a more or less stable trend for SO₂ & NO₂ however, SPM and RSPM show an increasing trend.

(Source: <http://www.cpcb.nic.in/Network.php> , <http://www.cpcb.nic.in/Chennai.pdf>)

(2) Laws and Polices

Some of these are:

- The Water (Prevention and Control of Pollution) Act, 1974 as amended in 1978 and 1988
- The Water (Prevention and Control of Pollution) Cess Act, 1977 as amended in 1991
- The Water (Prevention and Control of Pollution) Cess Rules, 1978. as amended in 1992
- The Air (Prevention and Control of Pollution) Act, 1981 as amended in 1987
- The Environment (Protection) Act, 1986
- The Environment (Protection) Rules, 1986
- The Hazardous Waste (Management and Handling) Rules, 1989 as amended in 2000 and 2003
- The Manufacture, Storage and Import of Hazardous Chemical Rules, 1989

- Manufacture, Use, Import, Export and Storage of Hazardous Micro-organism Genetically Engineered Organisms or Cell Rules, 1989
- The Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996
- The Bio-Medical Waste (Management and Handling) Rules, 1998 as amended in 2000
- The Recycled Plastics Manufacture and Usage Rules, 1999 as amended in 2003
- The Noise Pollution (Regulation and Control) Rules, 2000
- The Municipal Solid Wastes (Management & Handling) Rules, 2000
- The Batteries (Management & Handling) Rules, 2001
- The Public Liability Insurance Act, 1991 (No.6 of 1991). as amended in 1992
- The Public Liability Insurance Rules, 1991
- The National Environment Tribunal Act, 1995 (No.27 of 1995)
- The National Environment Appellate Authority Act, 1997
- The National Environment Appellate Authority (Appeal) Rules, 1997
- Coastal Regulation Zone Notification, 1994
- The Ozone Depleting (Regulation and Control) Substance Rules, 2000

State specific:

- The Tamil Nadu Water (Prevention and Control of Pollution) Rules, 1983
- The Tamil Nadu Air (Prevention and Control of Pollution) Rules, 1983

(Source: <http://www.tnpcb.gov.in/enforcement.asp>, http://www.tnpcb.gov.in/pdf/tnpcb_you2013.pdf)

(3) Environment Sustainability Index (ESI) 2010

The index aggregates indicators that reflect:

- anthropogenic activities of production, consumption and distribution that exert pressures on the environment,
- state of air quality, water quality, land use & agriculture, forests & biodiversity;
- measures of the impact of the current state of the environment and resource

extraction on ecosystem and human health; and

- policy responses and society's efforts to preserve the environment.

ESI is constructed as a composite index from 41 key environmental indicators selected using the Driving Force-Pressure-State-Impact-Response (DPSIR) framework. These indicators capture the driving forces that extract from and pollute the environment (**D**iving Force); depletion and pollution (**P**ressure); present condition of the environment (**S**tate), impact on the ecosystem and human health (**I**mpact) and policy and societal efforts to reduce impacts and protect the environment (**R**esponse)

ESI is designed to compare Indian States with their peers and does not indicate an absolute level of achievement. Although there are no clear normative benchmarks or thresholds for 'good' performance on many of the indicators, the sources on each indicator can be ordered from 'better' to 'worse'. The overall ESI score provide a quick snapshot of State performance, the sub-indices are far more

VII. Audit of Coastal and Marine Protected Areas-SAI Canada

More than 40% of the world's population (more than 2.8 billion people) live within 100 kilometres of the coast. Rapid urbanisation will lead to more coastal mega-cities containing 10 million or more people. Thirteen of the world's 20 megacities lie along coasts and nearly 700 million people live in low lying coastal areas less than ten metres above sea level. In Asia, the coastal mega-cities of Chennai (2005: population 6.9 million), Dhaka (12.4 million), Karachi (11.6 million), Calcutta (14.3 million) and Mumbai (18.2 million) are located only a few metres above sea level. One quarter of Africa's population is located in resource-rich coastal zones and a high proportion of gross

domestic product (GDP) is exposed to climate influenced coastal risks.

Fisheries and Aquaculture, Ports & Infrastructure/ Maritime Transport, tourism and Energy are the main marine economic activities. As per World Ocean Council global ocean economic activity is estimated at between USD 3-6 trillion/year (2011). Oceans are a primary source of protein for more than 2.6 billion people. Marine fisheries directly or indirectly employ over 200 million people. But the marine / coastal ecosystems are also important from the point of ecosystem services like regulating services (e.g. carbon capturing by mangroves), cultural and aesthetic services and other biological services (e.g. marine phytoplankton produce the organic matter). The commercially important species rely on non-commercial species for their existence and thus the marine biodiversity is of utmost importance.

The world's oceans are under threat from the effects of pollution and over-exploitation. As much as 40 per cent of the oceans are heavily affected by human activity, including pollution, overfishing and destructive fishing practices, and the loss of coastal habitats. The depletion of fish stocks is a critical issue for more than a billion people who depend on fish for food security, a main source of animal protein. However, 85 per cent of the world's fish stocks are fully exploited or overexploited. The Northeast Atlantic, Western Indian Ocean and Northwest Pacific have the highest proportions of fully exploited stocks. Since 1992, the proportion of fully exploited fish stocks has further increased by 13 per cent.

Conserving and protecting marine biodiversity is not solely an environmental priority. As recently reported at the 2012

World Economic Forum, the ocean's natural capital (the stock of ecological goods and services that can be maintained for use in the future) is intrinsic to the health and functioning of the world economy. Today, more than 1.5 billion people count on fish for their daily protein source. With the world population projected to reach 9 billion by 2050, humankind needs to double the production of food without further depleting Earth's natural capital.

As per the Aichi Target 11 under Convention on Biological Diversity at least 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved by 2020 through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascape.

A network of marine protected areas is a collection of individual marine protected areas that operates cooperatively in order to fulfill ecological aims more effectively and comprehensively than individual sites could do alone.

Considering this kind of significance of the coastal and marine ecosystems to nation of Canada the Supreme Audit Institution of Canada conducted the audit of Marine Protected Areas. The North American Marine Protected Areas Network organization, founded in 1999 under the auspices of collection of individual marine protected areas for Environmental Cooperation, represents a tri-national (Canada, Mexico, and United States) network of resource agencies, MPA aims more effectively and comprehensively than managers, and other relevant experts

committed to strengthening the conservation of biodiversity in critical marine habitats and to helping foster a comprehensive network of marine protected areas in North America. Fisheries and Oceans Canada, Parks Canada, and Environment Canada are the three federal authorities with specific, complementary mandates to establish and manage marine protected areas in Canada's oceans and Great Lakes. Fisheries and Oceans Canada is responsible for leading and coordinating the development and implementation of a national network of MPAs on behalf of the Government of Canada and also has a mandate to establish individual marine protected areas. Parks Canada is responsible for establishing marine protected areas to protect and conserve representative examples of Canada's natural and cultural marine heritage, to provide opportunities for public education and enjoyment, and to contribute to a national network of marine protected areas. Environment Canada is responsible for protecting habitat for a variety of wildlife, including migratory birds and species at risk.

Audit Objective:

The objective of this audit was to determine whether Fisheries and Oceans Canada and Parks Canada have planned, established, and managed a network of marine protected areas in accordance with their legislative mandates and policies and recognized good practices in order to conserve and protect Canada's marine biodiversity and fulfill Canada's international targets under the Convention on Biological Diversity.

Audit Criteria:

- Acts related to marine conservation, Oceans, Marine Parks etc.

- Convention on Biological Diversity, United Nations, 1992
- Studies / Papers of International Union for the Conservation of Nature
- Federal Strategies and Guidelines
- Guiding Policy, Frameworks and Operational Frameworks / Plans
- Management Planning Guidelines
- Ecosystem Status Report and Science Advisory Report of the Canadian Science Advisory Secretariat

Audit Scope and Methodology:

SAI Canada examined the coordinating and planning activities undertaken by Fisheries and Oceans Canada in relation to the development of a national marine protected area (MPA) plan. The scope included an examination of the planning approaches used, the consultations undertaken among departments, the actual plans, and supporting documentation.

They also examined the planning activities undertaken by Fisheries and Oceans Canada and Parks Canada to develop their department plans. The scope included an examination of the planning approaches used, the actual plans, and supporting documentation.

They examined whether Fisheries and Oceans Canada and Parks Canada developed and followed their approaches for establishing MPAs, including the three key steps in the establishment process: obtaining information for decision making, consulting key stakeholders, and designating the MPA. They focused their examination work on two of the most recently established MPAs, as they could be the most representative of recent management practices and performance.

They also examined the management and monitoring of the MPAs that were

established by Fisheries and Oceans Canada and Parks Canada. They examined whether the two entities had developed management plans that reflect department guidance for the 10 MPAs that were established for the purpose of marine protection. For more specific questions on implementation of management plans and the monitoring and reporting of results, they focused their examination on 2 MPAs that were established for a sufficient period of time to allow the entities to have proceeded with implementation of the plans and monitoring and reporting of the results achieved. During the course of the audit, in addition to reviewing the supporting documentation, SAI Canada interviewed key individuals at headquarters and at the regional offices for the two entities. They also conducted selected interviews with key stakeholders.

Audit Conclusions:

SAI Canada recognized that important work was being done to identify marine ecosystems that require protection, but concluded that Fisheries and Oceans Canada and Parks Canada had not planned, established, and managed a network of marine protected areas (MPAs) in accordance with their legislative mandates and policies and good practices in order to conserve and protect Canada's marine biodiversity and fulfill Canada's international targets under the Convention on Biological Diversity. It emphasized that the prosperity of many coastal communities in Canada with marine-based economies remained threatened due to the risk to the marine biodiversity.

SAI Canada pointed out that the Fisheries and Oceans Canada must complete a national MPA network plan for Canada and also establish functioning MPA networks in the 13 bioregions. Parks Canada must select

candidate sites in 15 additional marine regions and establish MPAs in 26 of its 29 marine regions where it has not already done so.

SAI Canada concluded that there was a need to determine whether the human and financial resources being allocated to this effort were enough to get the job done in a timely manner. At the current rate of progress, it would take many decades for Canada to establish a fully functioning MPA network and achieve the target established in 2010 under the United Nations Convention on Biological Diversity to conserve 10 percent of marine areas. It further stated that continual improvement of management practices and processes will enhance the government's ability to conserve and protect Canada's marine biodiversity and monitor the effectiveness of its MPAs in achieving planned results. SAI Canada called for exploring innovative approaches for fulfilling the objectives.

Audit recommendations:

On the basis of above conclusions SAI Canada offered following recommendations to the Canadian Government:

- Fisheries and Oceans Canada and Parks Canada should identify specific ecosystem services provided by existing and planned marine protected areas and assess their values so that Canadians and federal policy makers have better information to understand their associated benefits and costs.
- Fisheries and Oceans Canada has indicated that marine protected areas (MPAs) will be managed so that sustainable economic opportunities compatible with the conservation objectives of the MPAs will be permitted through different zoning in the MPAs. The Department should

develop practical guidance on how department officials are to assess economic opportunities to determine whether they are compatible with the conservation objectives of the MPAs.

- Parks Canada should develop practical guidance on how ecologically sustainable use is to be assessed and implemented in relation to its MPAs.

Significance for India / SAI India:

India also is a party to the United Nations Convention on Biological Diversity and blessed with marine resources which have been the source of livelihood for a substantial population. India represents 2.4% of the world's landmass and supports a population of over one billion people. India is also one of the 17 mega-biodiverse countries in the world, with 7.8% of the recorded species of the world, including 45,500 recorded species of plant and 91,000 recorded species of animal (MoEF 2014).

India has an extensive coastline of 7517 km length, of which 5423 km is in peninsular India and 2094 km is in the Andaman & Nicobar and Lakshadweep islands. This coastline supports a huge human population, which is dependent on the rich coastal and marine resources. It is estimated that nearly 250 million people live within a 50 km wide swathe along the coastline of India (UNISDR/UNDP 2012). Therefore, the ecological services of the marine and coastal ecosystems of India play a vital role in sustaining India's economic growth. Despite the tremendous ecological and economic importance and the existence of a policy and regulatory framework, India's coastal and marine ecosystems are under threat. Numerous direct and indirect pressures arising from different types of economic development

and associated activities are having adverse impacts on the coastal and marine biodiversity across the country. The marine protected area network in India has been used as a tool to manage natural marine resources for biodiversity conservation and for the well-being of people dependent on it.

Scientific monitoring and traditional observations confirm that depleted natural marine resources are getting restored and / or pristine ecological conditions have been sustained in well managed MPAs. There are 24 MPAs in peninsular India and more than 100 MPAs in the country's islands. The 24 MPAs of the mainland have a total area of about 8214 km, which is about 5% of the total protected area network of India and represents 0.25% of the total geographic area of the country. Dedicated efforts are required to secure and strengthen community participation in managing the marine protected area network in India.

The Gulf of Mannar Marine National Park, Sundarbans National Park, Gulf of Kachchh National Park, Gahirmatha Marine Sanctuary, Coringa Wildlife Sanctuary and Chilika Wildlife Sanctuary, on the mainland, have unique marine biodiversity and provide a range of ecological services to the local communities. India has also identified 12 protected areas as trans-boundary protected areas under the framework of the IUCN Trans-boundary Protected Area programme. Two of these sites are MPAs (Sundarbans National Park and Gulf of Mannar Biosphere Reserve). India has also designated six UNESCO World Heritage Natural sites, and Sundarbans National Park is one among them. Currently, according to expert opinion, 10 species of shark and ray, including the Whale Shark, all species of sea horse, the Giant Grouper, all

cetaceans, the Dugong, 9 species of shell, 5 species of sea turtle, one species of otter, all species of coral, all species of sponge and all holothurians that occur in the coastal and marine areas of India are considered to be under threat. Therefore, they have been protected under the Wildlife (Protection) Act, 1972 by being listed in Schedule I.

India has taken several steps towards achieving the Aichi Biodiversity Targets, especially Target No. 11 (at least 10% of coastal and marine areas are conserved in networks of protected areas) and Target No.14 (ecosystems that provide water, health, livelihoods and well-being are restored and safeguarded). Towards achieving these two targets, 106 coastal and marine sites have been identified and prioritized as Important Coastal and Marine Areas (ICMBAs) by the Wildlife Institute of India. Sixty-two ICMBAs have been identified along the west coast of India, and 4 have been identified along the east coast. These sites have also been proposed as conservation or communities' reserves to increase participation of the local communities in governance. More efforts are required to secure and strengthen community participation in the management of the MPA network in India.

There is lot of potential in environment audit of the coastal and marine protected areas as it is very relevant from the point of view of conservation of biodiversity as well as sustainable development of the coastal communities.

VIII. Compliance Audit: Implementation of E- waste (Management and Handling) Rules, 2011 by Central Pollution Control Board (C&AG Union Report No. 30 of 2015)

Electronics industry is one of the fastest growing manufacturing industries in the world. The demand in the Indian market is expected to reach USD400 Billion by year 2020. The demand for electronic goods is increasing at near 25% every year. The higher rate 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 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. 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.

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 channelize e-waste in the country, which otherwise were recycled in unorganized 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 producer², 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 centre³, dismantler⁴ and recycler⁵ of E- waste.

Central Pollution Control Board, Delhi (CPCB), an autonomous body under MoEF, is responsible for evolving guidelines for implementation of the Rules and overseeing the progress made in reduction of use of hazardous substances in EEE.

A Compliance 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. Thus the major audit criteria was E-waste (Management and Handling) Rules, 2011. The Report has been presented to the Parliament of India on 8th December 2015. The audit findings vis-à-vis the mandate and responsibilities of CPCB as mentioned in Schedule-III of the Rules were as mentioned below:

(i) **Co-ordination with SPCBs / PCCs:** CPCB was responsible for co- ordination with SPCBs / Pollution Control Committees (PCCs) of States / UTs which were in turn required to perform duties regarding regulation of e-waste through the rules. CPCB was responsible for co- ordination with SPCBs/PCCs for implementation of the Rules. Audit observed

that CPCB delayed its initial action and there was absence of sustained action to collect basic data regarding e-waste in the country.

Some states even reported that they did not have any authorised producers, collection centres and dismantlers / recyclers while replying to Parliamentary questions.

(ii) **Preparation of 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.

(iii) **Assessment of E-waste generation and processing:** 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,⁶ estimated quantity of e- waste generated in India in 2014 was 16.41 lakh tonnes. 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. As of March 2015, CPCB had estimates on generation of e-waste in respect of eight⁷ States/UTs and limited information on generation of e-waste in a few cities in three States⁸, based on studies carried out by concerned SPCBs/PCCs (2005 to 2013). However, there was no updated information

² 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.

³ A centre established to collect e-waste.

⁴ Any person/registered society/designated agency/company/association engaged in dismantling of used EEE into their components.

⁵ Any person who is engaged in the recycling or reprocessing used EEE or assemblies or their component.

⁶ The Global E-Waste Monitor 2014, by United Nations University – Institute for the Advanced Study of Sustainability

⁷ Assam, Chandigarh, Goa, Himachal Pradesh, Jammu and Kashmir, Maharashtra, Puducherry and Punjab.

⁸ Madhya Pradesh, Meghalaya and West Bengal.

on e-waste generation in respect of the high e-waste generating States such as Tamil Nadu, Uttar Pradesh, Delhi, Karnataka and Gujarat.

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. 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.

(iv) Recommending 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.

(v) 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.

(vi) Conducting training and awareness programmes: 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 CPCB held the workshops to discuss the proposed Guidelines for implementation of the Rules prior to its issue by CPCB but did not organise any awareness programme to educate various stakeholders about the provisions of the Rules.

(vii) 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. There were also shortcomings in the information to be included in the Annual Reports.

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

(viii) 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 values⁹ 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

⁹ 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.

implementation framework on RoHS enforcement based on self regulation model¹⁰. 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)¹¹ 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 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.

¹⁰ 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.

¹¹ An autonomous society under the Department of Electronics and Information Technology

(ix) **Initiatives for IT industry for reducing hazardous substances:** CPCB was 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.

(x) **Setting targets for compliance to the reduction in use of hazardous substance in manufacture of EEE:** CPCB was to set targets for compliance to reduction in use of hazardous substance in manufacture of EEE, however, CPCB initiated action for development of a framework for enforcing the provisions of RoHS only in March 2014. As of May 2015, CPCB had not set targets for compliance to RoHS. 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.

(xi) **Incentives and certification for green design / products:** CPCB was required to develop incentives and certification for green design / products. However, as of May 2015, no action was taken in this regard.

(xii) **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.

Conclusion: 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. The CPCB did not assess the quantity of e-waste generated in the country. It was unable to effectively coordinate with SPCBs / PCCs 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. 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.

The SPCBs, PCCs and Urban Local Bodies (ULBs) have been 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 areas. The Audit Offices responsible for audit of these bodies can take this audit further and see how their audited entities are faring in compliance of the Rules and the guidelines issued by CPCB. The issue being very important and gaining importance very rapidly the audits of these agencies can be taken up further.

Source:

http://www.saiindia.gov.in/sites/default/files/audit_report_files/Union_Compliance_Scientific_Departmen_Report_30_2015.pdf