Report of the Sub-Group on "Environment" for 12th Five Year Plan

(Dated October 2011)

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Ministry of Environment and Forests
Government of India

Section I: Subgroup Environment

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Chapter 1: Introduction

With the increasing emphasis on need for development, coupled with increasing urbanization, it is becoming apparent that the natural resources are to be used judiciously and sustainably. Increasing instances of - cities violating air pollution norms, rivers and other water bodies getting polluted due to discharge of untreated sewage and industrial wastewater, indiscriminate disposal of solid waste causing degradation and pollution of land - are source of concern both of the health of human and ecology. In addition to pollution of ambient air, the pollution of indoor air especially due to use of biomass for cooking in rural and peri-urban households is a matter of concern because of its adverse health impacts faced by most vulnerable section of society – women and small children. These issues are therefore needed to be addressed in timely and inclusive manner. Recognizing this, the 11th Five Year Plan envisaged a clear commitment to pursue a development agenda which is environmentally sustainable, based on a strategy that not only preserves and maintains natural resources but also provides equitable access to those who are generally denied this. It recognized the need to have environment protection at the core/centre stage of all policy formulation. Translating the vision of environmental sustainability will require that environmental concerns are given a high priority in development planning at all levels.

Though the Ministry of Environment and Forests (MoEF) is the nodal agency in the administrative structure of the Central Government for the planning, promotion, co-ordination and overseeing the implementation of India's environment related policies and programmes, it is important to recognize and appreciate the fact that environmental issues cut across various developmental sectors. It is therefore pertinent to understand that MoEF alone cannot address all the issues concerned with the conservation of natural resources and protection of environment. What is desired is that various sectoral ministries work in coordinated manner with MoEF to address these issues. Therefore the intersectoral action plans should be dovetailed with action plans of line ministries and adequate budgetary allocation to line ministries be made by the Planning Commission to implement these action plans. For instance, the air pollution and sewage and solid waste management require intersectoral action plan. The ministries to be engaged in implementation these action plans would be:

- Air pollution and vehicular pollution – MoPNG (ensuring supply of clean fuel), MoP (use of clean technologies for power), MoRTH (promoting public transport), MoH&FW (conducting health related studies), MNRE (promotion of renewable energy) and MoC (for supply of clean coal)
- Sewage treatment and solid waste management – MoUD (creation of infrastructure under JNNURM), MoWR (Cleaning of ponds), MNRE (implementing waste-to-energy projects), and MoH&FW (infrastructure related to biomedical waste)

The report of the Sub-group on 'Environment' discusses various policies and programmes of MoEF, institutional setup for environment management, progress of various schemes in the 11th Five Year Plan and suggests recommendations for the 12th Five Year Plan.

Chapter 2: Environmental Policies

2.1 Status of implementation of the National Environment Policy

To achieve the objectives of prevention and control of pollution and conservation of environment, a National Conservation Strategy and Policy Statement on Environment and Development, 1992, and Policy Statement on Abatement of Pollution, 1992 were adopted. These policies emphasized pollution prevention/abatement, and promotion of cleaner technologies to reduce industrial pollutants. Further to these policies, as a comprehensive policy to mainstream environmental concerns in all the developmental activities, the National Environmental Policy (NEP) was adopted in 2006. The NEP articulates the spirit of 'sustainable development'; it states that only such development is sustainable, which respects ecological constraints and the imperatives of social justice. The NEP reiterates the national commitment for environment protection and sustainable development. NEP proposed strategies and actions for protection and conservation of environment. Review of NEP was carried out in 2009-10. Monitoring of the implementation plan is ongoing and will continue during the 12th Plan Five Year Plan.

Outcome of the Ministry under the mandate of NEP has been the passage of the National Green Tribunal (NGT) Act in 2010. The Act paved the way for the establishment of the NGT. It is a green court established for the effective and expeditious disposal of conflicts related to environmental conservation and protection of other natural resources of the country. Relevant Rules have been notified. The Tribunal is operational in Delhi and expected to be fully functional in the 12th Five Year Plan period with establishment of benches at Bhopal, Chennai, Kolkata and Pune.

In addition, to address the delay in award of environmental clearances and improve the monitoring of clearance conditions in projects requiring EIA, creation of independent National Environmental Appraisal and Monitoring Agency (NEAMA) is proposed to be established in the 12th Plan. It will set up a new process for environmental appraisal of projects, and monitoring the observance of environmental management plans. It would be a recommendatory body, subject to final decision-making by the Environment Minister.

2.2 Other recent policy initiatives

A number of other policy and legislative initiatives have been taken by MoEF in the 11th Five Year Plan. These include:

1. Re-engineering of environmental clearance process in 2006
2. Notification of Hazardous Waste (Management, Handling and Transboundary Movement) rules in 2008 and its amendment in 2009
3. Amendment in National Ambient Air Quality Standards in 2009
4. Establishment of National Ganga River Basin Authority in 2009
5. E-waste (Management and Handling) Rules in 2011

6. Plastic Waste (Management and Handling) Rules 2011
7. Coastal Regulation Zone Notification in the year 2011

The details of these initiatives are discussed in the chapter 3 dealing with Regulatory Mechanism Assessment and Implementation.

2.3 Policies of sectoral Ministries which need to be dovetailed/harmonized

Many sectoral ministries have programmes and schemes that compliment the efforts of the MoEF. These include:

1. Restoration of Ponds - Ministry of Water Resources
2. Municipal Solid Waste Management - Ministry of Urban Development
3. Waste-to-energy programme - Ministry of New and Renewable Energy
4. Industrial Infrastructure Development Scheme supporting funding of CETPs and solid waste management projects – Ministry of Commerce
5. Vehicular pollution – MoRTH, MoPNG

2.4 Recommendation for the 12th Plan

- Futuristic and long-term planning to explore new approaches for sustainable development.

Chapter 3: Regulatory Mechanism Assessment and Implementation

The introduction of legislative measures for pollution control in the country commenced with the enactment of the Water (Prevention and Control of Pollution) Act, 1974, Air (Prevention and Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and recently the National Green Tribunal Act, 2010. To implement these legislations, the Ministry formulated various regulatory instruments (e.g., environment standards, consent administration, authorization, environment clearances, etc.) and created institutional infrastructures at the national, regional and state levels in the form of Central Pollution Control Board (CPCB), regional offices of MoEF and CPCB, State Pollution Control Boards/Pollution Control Committees (SPCBs/PCCs), State Department of Environment, and Environmental Research Institutes/Organizations, etc.

The Ministry has also launched several plan schemes to strengthen the regulatory mechanism for pollution abatement. These plan schemes include institutional strengthening, creation of common treatment facilities, establishment of Environmental Commission and Tribunals, Industrial Pollution Abatement through Promotion of Clean Technology and Preventive Strategies. In addition to these, forward looking and far-reaching initiatives viz. Charter on Corporate Responsibilities for Environment Protection (CREP), Comprehensive Environmental Pollution Index (CEPI) for estimation of pollution load for Industrial Clusters, recognition of environmental laboratories, roadmap for Bharat Stage emission-norms are also being implemented.

An elaborate network of water and air quality monitoring network is in place to facilitate enforcement of environmental regulations. In addition to expansion and modernization of monitoring network and existing testing facilities, new laboratories are set up to augment the monitoring and testing infrastructure in the country. Online emission monitoring system has also been introduced in Delhi and Manali & Cuddalore (Tamil Nadu) to get real time data. The roadmap for air and water quality monitoring stations in the country has been drawn. A source apportionment study for PM_{10} for six mega cities has been completed. Source apportionment study needs to be extended to other cities.

Other new regulatory tools to address industrial pollution include industrial self - Monitoring, and Representing Verification (MRV) and third party audit. The re-engineering of CPCBs/ SPCBs has been initiated by operational restructuring, strengthening manpower, augmentation of resources, IT-enabled consent management and data management and capacity building. Officers of SPCBs/PCCs are imparted training covering both specialized and general thematic areas for augmenting their capabilities for improving compliance and enforcement. The netting methodology has been adopted for timely disbursement of water cess to SPCBs/PCCs.

3.1 Adequacy of existing legislation

Despite having plethora of legislation and regulations, enforcement remains a key concern. The EP Act has been in force since 1986. Even after 25 years, the penalties mandated for environmental violations remain unchanged. These penalties no longer act as a deterrent to defaulting industries. Given the inflation and increasing administrative costs, the rate of penalties are required to be hiked upwards and made as an effective deterrent. Further, the effectiveness of SPCBs enforcement efforts is limited.

Some states have employed a bank guarantee to ensure compliance with the SPCB directives on consent to operate. Under this, the non-complying firm needs to post a bank guarantee to ensure implementation of the corrective actions within the stipulated timeframe. In case of non-compliance, the guarantee is forfeited. This acts as a powerful monetary penalty for a violator and a deterrent against future non-compliance. The section 5 of the E (P) Act related to issue of directions needs to have provision for furnishing of suitable bank guarantee to ensure environmental compliance. Such bank guarantee also needs to be obtained upfront at the time of grant of environmental clearance for developmental projects.

Self-monitoring in industries and reporting & verification process need to be refined and appropriate provisions are needed to be included in the E (P) Act itself. Disclosure statements need to be put in the public domain to ensure oversight by the civil society and its appropriate linkage with the regulatory regime. Enabling provisions are required to be made in the E (P) Act for regulatory authorities to levy and collect fees for providing specific services. These measures would improve the financial health of these agencies and thus, make them more effective.

Ministry has notified the Municipal Solid Waste (Management and Handling) Rules, in 2000 which is applicable to every municipal authority responsible for collection, segregation, storage, transportation, processing and disposal of municipal solid wastes in the country. The Rules stipulate specifications, source segregation, collection, transportation, waste processing, disposal and others.

For proper management of Bio-Medical Wastes (BMW) generated in the country, the Ministry of Environment & Forests notified the Bio-Medical Wastes (Management and Handling) Rules in 1998, under the E (P) Act, 1986. Three amendments have been issued so far. The Bio-Medical Wastes (Management & Handling) Rules, 1998 provides for segregation, packaging, storage, transportation, treatment and disposal of the bio-medical wastes. As per these Rules, it shall be the duty of every occupier of an institution generating BMW, to take all steps to ensure that such waste is handled without any adverse effect to human health and environment. Hospitals servicing 1000 patients and more per month are required to obtain authorisation from the respective SPCB/ PCC of Union Territory. New draft Rules on Bio-Medical Waste Management have been prepared replacing the existing Bio-Medical Waste (Management and Handling)

Rules 1998 and its Amendments. The new draft Rules are expected to be comprehensive and inter-alia cover:

- Listing of identified authorities and their corresponding duties for implementation of the Rules
- Changes to simplify and rationalize the colour coding system for disposal of bio-medical waste
- Modifications in the Categories of Bio-Medical Wastes and their treatment and disposal options
- Changes in the format for submissions of Annual Report by the State Pollution Control Board and
- It is also proposed to cover all the Health Care Establishments, irrespective of the number of patients serviced per month for obtaining authorization from the Prescribed Authority.

The Hazardous Wastes (Management and Handling) Rules, 1989 and as amended thereafter were re-visited in 2007 and the Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008 were published on 24th September, 2008. At present, these rules are the main instrument to ensure proper management of hazardous waste in the country. These rules are in harmony with Basel Convention and enable the authorities to control handling, movement and disposal of hazardous wastes. As per the rules, every person, who is engaged in generating or handling of hazardous waste, is required to obtain authorization from the concerned SPCB/PCC. Further, for recycling of the hazardous wastes listed in Schedule IV, the units in addition to authorization are required to be registered with the SPCB concerned. In addition, to address problems related to improper recycling of lead-acid batteries, Ministry has notified the Batteries (Management and Handling) Rules in 2001.

In order to streamline the EIA process, Ministry has undertaken re-engineering of Environmental Clearance (EC) Process and issued an Environmental Impact Assessment Notification in 2006 and amendment in 2009. This notification replaces the earlier EIA Notification, 1994. Under this Notification, developmental activities have been categorized into Category 'A' and Category 'B' based on potential impacts instead of investment criteria. Category 'A' projects/activities will be appraised at the Central level by Expert Appraisal Committees while Category 'B' projects/activities will be appraised at the state level by the State Level Environmental Impact Assessment Authority.

At present, e-waste management is regulated under the Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008. Since e-waste is one of the fastest growing waste streams in the country, a need for separate rules on e-waste management was felt. The Ministry has notified the E-waste (Management and Handling) Rules, 2011 on 12th May, 2011. These rules will be effective from 1st May 2012. The concept of Extended Producer Responsibility (EPR) has been enshrined. Accordingly, Producers are required to set up

collection system and meet the costs involved in the environmentally sound management of e-waste generated from the 'end of life' of their own products.

The Ministry has also notified the Plastic Waste (Management and Handling) Rules, 2011 (amended on 02.07.2011). Under these Rules, the State Pollution Control Boards or Pollution Control Committees are responsible for enforcement of provisions related to registration, manufacture and recycling and the municipal authorities are responsible for enforcement of provisions related to use, collection, segregation, transportation and disposal of plastic waste. The Municipal authority shall be responsible for setting up, operationalization and coordination of the waste management system and for performing the associated functions, namely: collection, storage, segregation, transportation, processing and disposal of plastic waste. They are required to set up collection centres for plastic waste involving manufacturers in line with the principle of Extended Producers Responsibility, ensure its channelization to recyclers, to create awareness among all stakeholders about their responsibilities and to engage agencies or groups working in waste management including waste pickers.

Draft rules on Hazardous Substances (Classification, Packaging and Labelling) Rules, 2011 have been notified inviting public comments and suggestions. These rules will give guidance to the manufacturers and transporters for assigning hazard classes, use proper shipping name, suitable packaging, requisite label, marking and use of updated Safety Data Sheet for transportation.

To ensure proper management of chemical accidents, the Ministry has notified two sets of rules namely - the Manufacture, Storage and Import of Hazardous Chemical (MSIHC) Rules, 1989 and the Chemical Accident (Emergency Planning, Preparedness and Response) Rules, 1996. The MSIHC Rules provide indicative criteria for hazardous chemicals and listed 684 hazardous chemicals. The rules stipulate notification and approval of sites, preparation of material safety data sheet, preparation and updation of safety report/ safety audit report notification of major chemical accidents, preparation of On-site Emergency Plans by the occupier and the Off-site Emergency Plans by the Districts Authorities. The Schedule V of the MSIHC Rules listed the authorities responsible for implementation of the provisions of the Rule. The Chemical Accident Rules envisage constitution of Crisis Groups at Central, State and Local level. The Central Crisis Group is headed by the Secretary (E&F).

3.2 Status of implementation of regulations

To ensure environmental compliance, the Ministry has been implementing various regulations at national, regional and state levels. The tools employed to ensure compliance include:

1. Inspection and monitoring (I&M) to ensure compliance to environment standards at the state level
2. Consent to Establish/Operate, authorization to handle hazardous waste at the State level
3. Environment clearances and post-project monitoring at both the Central and State levels
4. Annual environmental audit statement submitted by industries

Despite efforts, the compliance to the environment standards has been not satisfactory. The existing I&M programme has been inadequate due to lack of technically qualified manpower across the board in SPCBs/PCCs. The annual audit statement submitted by the industrial units under EP Act is only a ritualistic exercise. These reports do not report any violation on account of any environmental parameter.

The administration of consents to establish and operate is a regulatory tool for enforcing environmental standards which is required to be obtained by the industry at the time of establishment as well as at the time of operation. Consent to industries for meeting the standards for disposal of treated liquid effluent and gaseous emissions are described under Section 25/26 of the Water Act and under Section 19 of the Air Act, respectively. To simplify consent administration, some SPCBs have introduced a common consent form under the Water Act, 1974 and Air Act, 1981, whereas most of the SPCBs are still granting consent separately for these Acts. Some of the Boards have IT-enabled consent management for faster execution, monitoring and transparent decision making.

At present only 3 SPCBs out of 35 get financial support from the States. Other SPCBs which are not financially supported by their State Governments with little or no resources of their own, find it difficult to monitor the environmental compliance. These States and the one which do not get assistance under multilateral or bilateral programmes need to be strengthened to develop their capabilities. In addition, there are States which are not industrially developed but have large number of small-scale industrial units which have adverse impact on human health and environment. The ecology is also more vulnerable to assimilation of pollution in these regions. These SPCBs require additional financial support under the 12^{th} Plan.

The progress on waste and chemical management Rules is as follows. Presently, only about 75 per cent of the bio-medical wastes generated in the country is collected, segregated and treated in accordance with the Bio-Medical Waste (Management and Handling) Rules, 1998 and the rest is apparently disposed of without any treatment along with the municipal solid waste. In addition to the 11,948 captive treatment and disposal facilities developed within some Health Care Facilities (HCFs), there are 177 Common Treatment and Disposal Facilities in operation in the country which were developed mostly by the private entrepreneurs. These common facilities cater to the needs of small hospitals, dispensaries and nursing homes, which are not in a position to set up their own treatment and disposal facilities because of high cost involved. There is still some gap between the BMW generated and treated which needs to be filled by creating adequate infrastructure in the country.

The major constraints in implementation of the Rules are lack of adequate equipment and infrastructure facilities for treatment and disposal of bio-medical wastes and lack of awareness and proper training to the medical and para-medical personnel in Health Care Establishments. Some other important issues in proper management of bio-medical waste are segregation of waste at source of generation, new technologies to be promoted to destroy toxic bio-medical

waste, need to focus on small Health Care Facilities (HCFs) and HCFs in rural areas and minimization of bio-medical waste generation in Health Care Facilities. The other constraint is lack of adequate manpower in SPCBs/PCCs for compliance monitoring and taking actions against defaulters.

An inter-ministerial coordination committee has also been constituted to co-ordinate effective implementation of the Hazardous Waste (HW) Rules, particularly to coordinate implementation of provisions for import and export of hazardous wastes. The permission for import is granted on the case to case basis. An Expert Committee has been constituted by the Ministry to scrutinize applications for import/export of hazardous wastes. In addition, a Technical Review Committee has been set up under these Rules, to examine the matter of disputes regarding classification and disposal of hazardous wastes and provide technical inputs for bringing out amendments to these rules for their effective implementation. The occupier of the facilities generating hazardous wastes, and recyclers, etc. are required to file annual return, regarding the hazardous wastes handled by them, to the State pollution Control Board concerned.

As per the available information there are about 1912 Maximum Accident Hazard (MAH) Units located in 304 districts under MSIHC Rules. The Off-Site Plans are available for 192 districts and On-Site plan are available for 1873 MAH Units. The Off-site Emergency Plans of 57 districts are under preparation. Regarding the Chemical Accident Rules, as per the available information, 18 States have constituted the State Crisis Group, District Crisis Groups and Local Crisis Groups. Two States – Goa and Chandigarh have constituted State Crisis Groups and Districts Crisis Groups. Bihar, Meghalaya, Uttarakhand, Manipur and Jharkhand have constituted State Crisis Groups. There are no MAH Units in Arunachal Pradesh, Daman & Diu, Dadra & Nagar Haveli, Lakshadweep, Mizoram and Sikkim.

3.3 Recommendations for the 12th Plan

- Amendment to the E (P) Act, 1986 to bring more effective control of pollution caused by industries. These revisions include:
    a. Upward revision in the penalties provided in the Act to make them effective deterrent.
    b. Enabling institutions to charge fees for specific services rendered in order to make them financially self-reliant
    c. A provision of the Bank Guarantee for specific performance including restoration of damaged environment has to be specifically incorporated in the Act
    d. Provision for civil administrative adjudication to fast track levy of penalty
- Common consent/authorization mechanism which is vogue in some SPCBs to be adopted by other SPCBs
- In order to ensure better monitoring of clearance conditions at field level, review of functioning of and increasing number of regional offices of MoEF is recommended
- Adoption of IT-based clearance and consent management system

- Environmental database to be put on geospatial platform
- Up-gradation of existing laboratories to NABL or ISO 9001 and ISO 17025 standards to improve their technical competency.
- Creation of infrastructure including office building, laboratories and vehicles for strengthening surveillance purposes.
- Inspection of industrial units by SPCBs/PCCs needs to be supplemented by third party audit. For this purpose, industry may be charged using the polluters pay principle. Panel of accredited consultants may be deployed by SPCBs/PCCs and allocation of auditors can be done at SPCB/PCC level
- Template for annual audit needs to be developed – simpler one for MSMEs and more exhaustive one for larger units. The audit statement to be put in public domain for ensuring oversight by the civil society. Environmental audit should be outsourced to empanelled consultants
- Create awareness about environmental regulations amongst all stakeholders

Chapter 4: Schemes and Programmes

The 11th Five Year Plan of the Ministry had rationalized, by suitably merging/clubbing, its large number of smaller schemes into 22 thematic schemes. Of these 22 schemes, nine schemes fall under the "Environment & Ecology" sector: six schemes being Central Sector, and three Centrally Sponsored Schemes. The nine thematic schemes involve 36 individual schemes/programmes.

4.1 Existing schemes and programmes of MoEF

A description of these schemes/programmes and their performance during the 11th Plan are summarized below.

4.1.1 Environmental Monitoring and Governance

4.1.1.1 Central Pollution Control Board (CPCB)

CPCB, constituted under the Water (Prevention and Control of Pollution) Act, 1974, is a 100% Grants-in-aid institution of the Ministry of Environment and Forests, Government of India. CPCB serves as a technical wing of the Ministry and coordinates with the State Pollution Control Boards (SPCBs)/Pollution Control Committees (PCCs) for implementation of plans and programmes relating to abatement of pollution. Project and programmes are executed through in-house efforts and with the assistance of Research Institutions like IITs, Engineering Colleges, Universities and R & D Institutions.

In addition to the implementation of Water and Air Acts, CPCB has planned various programmes relating to implementation of Rules framed under the Environment Protection Act, 1986 such as Hazardous Wastes (Management, Handling & Trans-boundary Movement) Rules, Bio-medical Waste, Municipal Solid Wastes, Plastics Waste and others. The plans and programmes are formulated based on the thrust areas identified by the Ministry of Environment and Forests under the National Environment Policy (NEP), 2006 and also as per the issues raised by the State Pollution Control Boards (SPCBs) and Pollution Control Committees (PCCs). Some of the key activities/ deliverables of CPCB include:

- Addition of 181 new ambient water quality monitoring stations during the 11th Plan so far, taking the total network of water quality monitoring stations to 2000.
- Addition of 46 new ambient air quality monitoring stations during the 11th Plan so far, taking the total network air quality monitoring stations to 665.
- Ambient noise monitoring network initiated in 2010. Increasing noise monitoring network from 70 to 160 stations by covering 18 other cities
- Establishment of continuous ambient air quality monitoring stations in 4 metro cities
- Monitoring compliance of CETP, STP, CBMWTF and TSDF.

- Implementation of action plan in 43 critically polluted industrial clusters identified through CEPI.
- Inventory of biomedical waste, hazardous waste, plastic waste, battery waste generation in major cities in India.

CPCB is being strengthened in terms of manpower, computerization, up-gradation of laboratories, and preparation of environmental database on GIS/GPS platform, Infrastructure in terms of Training Facilities, Vehicles and Building for CPCB Head Office, Delhi and its Zonal Office at Shillong. The proposed strengthening is in accordance with the IIM, Lucknow report. The report has been accepted in principle by the Ministry. The Report envisages targets/milestones to be achieved up to 2017 by CPCB.

4.1.1.2. Establishment of Environment Protection Authorities, Commissions and Tribunals

Following Authorities have been functional during the 11th Plan for implementation of regulations and as well compliance with the directions of Hon'ble Supreme Court:

- National Environmental Appellate Authority under National Environment Appellate Authority Act, 1977 to hear appeal with respect to industries, operations or processes;
- Loss of Ecological (Prevention and Payment Compensation) Authority for the State of Tamil Nadu to deal with pollution created by the tanneries and other polluting industries in Tamil Nadu
- Environmental Pollution (Prevention and Control) Authority (EPCA) for the National Capital Region for compliance relating to environmental standards, emission or discharge of pollutants, steps to control vehicular pollution, restriction of industries etc.

The National Green Tribunal (NGT) has been established on 18.10.2010 under the National Green Tribunal Act, 2010 for an effective and expeditious disposal of cases relating to environmental protection and conservation of forests and other natural resources, including enforcement of any legal right relating to environment, and giving relief and compensation for damages to persons and property and for matters connected therewith or incidental thereto. It is a specialized body equipped with the necessary expertise to handle environmental disputes involving multi-disciplinary issues. With the setting up of NGT, the National Environmental Appellate Authority has been wound up and all pending cases before it transferred to the NGT.

As a part of the larger agenda of environmental regulatory reforms and to improve the environmental governance in the country, particularly in the fields of environment impact assessment and coastal zone management, Ministry has initiated a proposal to establish a National Environment Assessment and Monitoring Authority (NEAMA).

4.1.1.3 Activities under EIA

Environmental Impact Assessment is a well-recognized management tool for incorporating environmental concerns in the development project at the planning stage. Environmental clearance has been made mandatory since January, 1994 in respect of 32 developmental activities including industry, Thermal Power, Mining, River Valley and Infrastructure projects and new constructions and industrial estate projects etc. The Ministry of Environment & Forests had undertaken Re-engineering of Environmental Clearance (EC) Process and issued an Environmental Impact Assessment Notification vide S.O. No.1533 (E) dated 14.09.2006. This notification replaced the EIA Notification, 1994. Under this Notification, developmental activities have been categorized into Category 'A' and Category 'B' based on potential impacts instead of investment criteria. Category 'A' projects/activities will be appraised at the Central level by Expert Appraisal Committees while Category 'B' project/activities will be appraised at the state level by the State Level Environmental Impact. Expert Appraisal Committees will be accorded EC by the State Level Environment Impact Assessment Authorities to be constituted by the Central Govt. Environmental Clearance are issued stipulating necessary environmental safeguard for mitigating adverse environmental impacts.

The Notification was amended in December, 2009 for further streamlining the process. For facilitating preparation of better quality EIA Report, sector specific Manuals have been prepared for the benefit of all the stake holders and are posted on Ministry's website. Further, a scheme on accreditation of EIA Consultants has been initiated in consultation with the Quality Council of India (QCI) with a view to improve quality of EIA Report. Ministry has issued a circular indicating that after June 30, 2011, only the accredited EIA Consultants would be permitted to submit the EIA Reports and appear before the EACs during consideration of projects.

Developmental activities in the Coastal Regulation Zone are regulated by the coastal Regulation Zone Notification, 1991. Based on the experience in implementation of this Notification over two decades and the inputs received from various Committees including the Report of the Committee chaired by Prof. M.S. Swaminathan entitled Final Frontier, a re-engineered CRZ Notification, 2011 was notified on 6th January, 2011 with a aim to ensure livelihood security to fishing and other local communities living in coastal areas, to conserve and protect coastal stretches and to promote development based on scientific principles. A Notification has also been issued on 6th January, 2011 for similar purpose as the Island Protection Zone (IPZ) for the four Islands of Andaman & Nicobar (Middle Andaman, North Andaman, South Andaman and Greater Nicobar) and the Lakshadweep. The notifications cover the categorization of CRZ areas, permissible and prohibited activities, regulation of permissible activities in CRZ areas, procedure for clearance, preparation of Coastal Zone Management Plan, areas requiring special consideration etc.

4.1.2. <u>Pollution Abatement</u>

4.1.2.1 Industrial Pollution Abatement through Preventive Strategies

The policy statement for abatement of pollution lays emphasis on preventive aspects of pollution abatement and promotion of technical inputs to reduce industrial pollution. One of the simplest preventive strategies is to minimize the waste in production of products and goods. The main

objective of waste minimization is to optimize the consumption of raw materials and also reduce waste generation by adopting production techniques which are cleaner in nature and which can be adopted by the existing units without necessarily changing the production processes or unit operations. The approach to the problem is towards utilizing the existing production facilities in an optimal manner.

The objectives of the scheme are following: To assist the primary small units and some medium scale units who do not have access to the requisite technical expertise to achieve waste minimization but exclude procurement of equipment and hardware; Establishing and running Waste Minimization Circles (WMCs) in clusters of Small & Medium Industries; Capacity building in the area of Waste Minimization/Cleaner Production through training; Waste Minimization demonstration studies in selected industrial sectors; Preparation of sector specific technical manuals on waste reduction, reuse and recycling; and awareness programs and preparation of compendium of success stories on cleaner production/waste minimization.

Important Activities undertaken for waste minimization include demonstration projects, training programs, establishment of Waste minimization circles, organization of workshops/seminars, and publications of New letters. A total of 157 waste minimization circles have been established in the industrial sector so far benefiting 6000 SMEs and 12 projects are ongoing in various sectors.

4.1.2.2 Assistance for Abatement of Pollution, Environment Policy and Law

The Scheme meets the need to strengthen the various SPCBs and State Environment Departments for enforcing the statutory provisions for taking up pollution abatement measures. The Central Government has been funding the State Pollution Control Boards and State Environment Departments and other national research institutes. The purpose of funding is to strengthen the State Departments of Environment through additional technical manpower and State Pollution Control Boards through scientific analytic equipment that are expensive and hence cannot be procured on State Government's own funds. Funds to the State Boards are released for equipment and specific studies and projects which would need to be completed within a specific time frame to meet the objective of Policy Statement for abatement of Pollution.

4.1.2.3. Clean Technology

The objectives of the scheme include providing support to development & promotion of Cleaner Technologies through setting up of demonstration projects, development of tools and techniques for pollution prevention, and formulation of sustainable development strategies. So far 20 projects have been completed in the area of Carrying Capacity, Life Cycle Assessment, Demonstration projects for development of indigenous technology and capacity building for the environmental managers and 15 demonstration projects are ongoing.

Given the stipulation in National Environment Policy, 2006, Ministry intends to take up the initiative to set up a mechanism to network technology research institutions in the country, public and private, for cooperation in technology research & development and adaptation, information, and evaluation of *clean technologies*. It will create a database of such technologies, and promote dissemination of new technologies developed in India and Abroad.

4.1.2.4. Common Effluent Treatment Plants (CETPs)

The main objective of the scheme is to reduce the treatment cost borne by an individual member unit to a minimum while protecting the water environment to a maximum. Wastewater treatment and water conservation are the prime objectives of the CETP. The concept of CETP was envisaged to treat the effluent emanating from the clusters of compatible small scale industries. It was also envisaged that burden of various Government authorities working for controlling pollution and monitoring of water pollution control could be reduced once the CETPs are implemented and commissioned.

The financing pattern for the CETPs consists of 20% promoter's contribution 30% loans from financial institutions, 25% State and 25% Central subsidy in form of Grant. The funds from the Government of India are routed through the respective State Pollution Control Boards. The CETPs are managed by a CETP Company, formed by the small-scale industrial units intending to construct a CETP.

A total number of 114 CETPs have been set up in the country, of which 11, with an industrial waste water treatment capacity of 142 mld, have been financed under this scheme during the 11th Plan.

4.1.2.5 Hazardous Substances Management

Hazardous Substances Management involves planning and overseeing the implementation of the policies and programmes on management of chemical emergencies and Hazardous substances viz, chemicals & wastes. The activities are carried out under three thrust areas i.e. Chemical Safety, Chemical Accident Prevention and the Sound Management of Hazardous Wastes and Municipal Solid Wastes. The activities initiated accordingly, include preparation of offsite emergency plans, setting up of emergency response center, establishment of Common Treatment, Storage and Disposal Facilities (TSDFs) for industrial hazardous wastes. Preparation of hazardous analysis reports, etc.

An externally aided project on “capacity building for industrial pollution management” has been initiated in 2010-11 to establish a national programme for priority remediation, rehabilitation and environmental improvements of identified contaminated sites in Andhra and West Bengal.

A roadmap has been evolved for proper *management of wastes* in the country, including issues such as Municipal solid waste, plastic waste, e-waste, Bio-Medical wastes etc A comprehensive regulatory framework has been put in place for *hazardous substances management* in the country. A total of 177 Common Biomedical Waste Treatment Facilities (CBWTF), 29 Common Treatment, Storage, and Disposal Facilities (TSDF) and 14 Common Incinerators have been developed in the country for disposal of hazardous wastes.

4.1.3. Research & Development for Conservation and Development

4.1.3.1. Botanical Survey of India, BSI

The BSI is the apex research organization under the Ministry of Environment and Forests, Govt. of India for carrying out taxonomic and floristic studies on wild plant resources of the country through *Survey, Documentation and Conservation*. Its objectives include (i) to undertake intensive floristic surveys and collect accurate and detailed information on the occurrence, distribution, ecology and economic utility of plants in the country, (ii) to collect, identify and distribute materials which may be of use to educational and research. institutions, and (iii) to act as custodian of authentic collections in well planned herbaria and to document the plant resources in the form of local, district, state and national flora. During the successive plan periods, the functions of BSI were expanded to include various new areas such as inventorying of endemic, rare and threatened plant species; evolving conservation strategies; studies on fragile ecosystems and protected areas, like wildlife sanctuaries, national parks and biosphere reserves; multiplication and maintenance of endemic and threatened plant species, wild ornamentals, etc., in Botanic Gardens and Orchidaria; documentation of traditional knowledge associated with plants and development of National Database of herbarium specimens/live collections/botanical paintings/illustrations, plant distribution and nomenclature, plant uses, etc.

On an average, BSI takes up about 60 field survey tours across states, documents about 1000 species, ex-situ conservation of about 100 species and digitization of about 15000 species annually.

4.1.3.2. Zoological Survey of India, ZSI

The function of ZSI primarily is to explore and inventories the faunal resources (diversity) of the country and to collect and document the base line data with regard to taxonomy, distribution, bio-ecology, etc., of all available animal groups. Over the successive plan periods the functions of Zoological Survey of India have expanded gradually encompassing areas like the Environmental Impact Assessment with regard to fauna; survey of Conservation Areas; Status Survey of Endangered Species; Computerization of data on faunal resources; Environmental Information System (ENVIS) on faunal diversity, etc.

On an average, ZSI undertakes around 145 field surveys and publishes about 45 publications annually.

4.1.3.3. G.B.Pant Institute of Himalayan Environment and Development (GBPIHED), Almora

The GBPIHED Institute is a Developmental Research Institute for sustainable development of Indian Himalayan Region (IHR). The Institute designs and implements R&D activities on priority environmental problems; develops and demonstrates best practices and delivers technology packages for improved livelihood options for the people of IHR. The identified thematic categories for Institute R&D activities include: (i) Watershed Processes and Management (WPM), (ii) Biodiversity Conservation and Management (BCM), (iii) Environmental Assessment and Management (EAM), (iv) Socio-economic Development (SED),

(v) Biotechnological Applications (BTA), and (vi) Knowledge Products and Capacity Building (KCB). The project sites, spread over different parts of IHR, have been selected carefully keeping in view the biophysical heterogeneity and location-specific needs of the inhabitants. All activities are need-based, target-oriented and time-bound. Research, demonstration and dissemination are underlying elements of all project activities geared towards development of environment-friendly technology packages.

4.1.3.4. Assistance to Botanic Gardens

The scheme aims to promote ex-situ conservation and propagation of rare and endemic plant genetic resources in different regions of the country through a network of botanic gardens. The scheme provides a one-time financial assistance to existing botanic gardens for strengthening their infrastructural facilities, to facilitate conservation and propagation of rare and endemic plant species of the region. Currently, financial assistance is being provided to 12 gardens. The objectives of the scheme include:

- Ex-situ conservation and propagation of rare and endangered endemic plant species;
- Strengthening of existing infrastructural facilities to facilitate conservation of germplasms, establishment of seed banks, arboreta and mist propagation facilities.
- Education and public awareness in respect of endemic plant species;
- Reintroduction of endangered species in wild for in-situ propagation in natural ecosystems in collaboration with forest department.

4.1.3.5. Taxonomy capacity building Project

The All India Coordinated Project on Taxonomy has organized specialist groups drawn from Universities, Botanical and Zoological Surveys of India to take up taxonomic work on animal viruses, bacteria and archaea, algae, fungi, lichens, bryophytes, pteriodophytes, gymnosperms, palms, grasses, bamboos, orchids, helminthes and nematodes, Microlepidoptera and Mollusca. Training in plant and animal biosystematics has also been recognized as an important component.

The project has identified 30 thematic areas for inventorising, monitoring, and conserving biodiversity in the field of taxonomy. So far around 90,000 species of animals and 45000 species of plants have been identified and described under the project.

4.1.3.6 .Biodiversity Conservation

Various activities undertaken under this programme include National Biodiversity Authority, enactment and implementation of biodiversity legislation, preparation of micro level action plan under NBSAP, development and implementation of Biosafety regulatory framework and capacity building in matters relating to GEAC, and conservation of medicinal plants, sacred groves and coastal and marine biodiversity.

Under NBA, so far SBBs have been established in 24 states, 30000 BMCs in 14 states set up, and Peoples' Biodiversity Registers set up in 6 states. The 11th Conference of Parties of the CBD

will be hosted by India in October 2012. This provides India with an opportunity to consolidate, scale up and showcase its initiatives and strengths on biodiversity. India with strong institutional, legal and policy framework, and has the potential and capability to emerge as the world's leader in conservation and sustainable use of biodiversity.

4.1.3.7. National Natural Resource Management scheme, NNRMS

NNRMS involves utilization of remote sensing technology for accurate inventory of resources like land, water, forests, minerals, ocean, etc and to utilize this information for monitoring changes in ecological system. A Standing Committee on Bio-resources and Environment guides various activities under the scheme. Currently there are 20 ongoing projects, and 5-6 new projects are taken up annually.

4.1.3.8. Research and Development

The Ministry funds research in multi-disciplinary aspects of pollution environment ecosystems protection, conservation and management at various universities, institutions of higher learning, national research institutes and non-governmental organizations in identified thrust areas under its Research & Development (R&D) Programme. The objective of the scheme is to generate information required to develop strategies, technologies and methodologies for better environmental management. It also aims at attempting solutions to the practical problems of resource management, conservation of natural resources and eco-regeneration of degraded areas. Further, the scheme also seeks to strengthen infrastructure to facilitate research and scientific manpower development. In order to achieve these objectives, research grants are provided in the identified thrust areas to various organizations (universities, colleges recognized by UGC, institutions of CSIR, ICAR, ICMR, ICSSR and recognized non- governmental scientific organizations) all over the country.

The research guidelines were revised by the Ministry in 2006, supporting research in Environment which inter-alia includes thrust areas of research and their prioritization. Recent new initiatives taken up by the Ministry include Institution of – National Environmental Sciences Fellows Programmes, institution of Mahatma Gandhi Chair for Ecology and Environment, collaborative Research Programme with CSIR, new Institutions - National Environment Protection Training & Research Institute (NEPTRI).

4.1.4 Conservation of Natural resources and Eco-systems

4.1.4.1. Conservation of Corals, Mangroves and Wetlands

The scheme aims at laying down policy guidelines for conservation and management of corals, mangroves and wetlands; to provide financial assistance for undertaking conservation work; to monitor implementation of programme for conservation and to make inventory. The main activities under the scheme include: data collection and survey, identification of problems, mapping and landscape planning, hydrology, control of encroachments, eutrophication and abatement, aquatic weed control, wildlife conservation, fisheries development, environmental awareness and research on various aspects of wetland/mangroves processes and functioning.

Based on the recommendations of relevant National Committees, wetlands identified for intensive conservation has increased from 103 in 2007 to 115 wetlands in 2010 covering 26 States/UT. Five more wetlands have been recommended for inclusion in the list. Other areas identified for conservation and management include 38 Mangroves and 4 Coral Reef sites.

The Ministry has also notified the Wetlands (Conservation and Management) Rules, 2010 in December 2010. These Rules, which for the first time lay down legally enforceable provisions for the conservation and management of Wetlands, have been drafted to ensure better conservation and management, and to prevent further degradation of existing wetlands in India.

4.1.4.2. Biosphere Reserves

The scheme aims at in-situ conservation of representative ecosystems of the major bio-geographic zones of the country having global importance. Sustainable development, protection research, monitoring, education, training and information exchange are major components of the scheme. The Central Govt. provides assistance for approved items of activities/interventions in these reserves. The objectives of the scheme include conserving the plant and animal diversity within natural ecosystems through enhanced protection and management interventions; diversity of species on which their continuing evolution depends; to provide areas for multi-faceted research and monitoring; to provide facilities for education and training; and to ensure sustainable use of natural resources through most appropriate technologies for improvement of socio-economic conditions and local communities. Research projects are also supported to monitor and understand changes in structure and functioning of biosphere reserves. The Ministry has so far designated 17 Biosphere reserves for conservation under the scheme.

4.1.4.3 National Lake Conservation Programme, NLCP

The objective of this programme is to restore and conserve the polluted lakes in urban and semi-urban areas of the country which are degraded due to wastewater discharge into the lake. Conservation activities include prevention of pollution from point sources, in-situ measures of lake cleaning, catchment area treatment, public awareness and other location specific activities. The funding pattern of the scheme is on 70:30 cost-sharing between the Centre and the States.

So far under NCLP, a total of 41 projects for conservation of 61 lakes in 14 states at an approved cost of Rs 1028.19 crore have been sanctioned. Conservation works for 18 lakes have been completed so far.

4.1.4.4. Bio-diversity conservation and Rural Livelihood improvement Project

The objective of the BCRLIP project is conservation of biodiversity in selected landscapes while improving rural livelihoods through participatory approaches. The project , with a total cost of Rs 137.37 crore to be funded by IDA and GEF funds, besides contribution from Central Government, states and the beneficiaries, is spread over six years. Major components of the project include demonstration of landscape conservation approaches in two pilot sites, strengthening of knowledge management and National capacity for replication of landscape conservation approaches, scaling up and replication of successful models of conservation in additional landscape sites, and coordination of landscape conservation. The project would become effective from 2011-12 and during the 11th Five Year Plan an expenditure of Rs 4.73 crore is likely to be incurred.

4.1.5. Environmental Information, Education and Awareness

4.1.5.1.Environmental Education and Awareness

The Environment Education and Awareness Scheme has been designed and developed to ensure incremental and accelerated spread of environmental awareness in the country. Various programmes under the scheme are conducted for creating and spreading environmental awareness through non-formal activities as well as through formal education system. The major programme under this scheme are National Green Corps, National Environmental Awareness Campaign, Organisation of Seminars/Symposia/Workshop, Mass Awareness through print & electronic media, film, theatre, Publication of relevant material, Global Learning and Observations to Benefit the Environment, etc. These Programmes are conducted through cross section of organisations viz; Eco-clubs in schools, NGOs, Colleges, Universities, Research institutions, women and youth organizations, Professional societies, IGNOU, Other Professional Societies, etc.

The NEAC is launched all over the country every year on an agreed environmental theme in which more than 10,000 organisations including central and state govt. departments, education institutions, NGOs and other voluntary agencies participate. National Green Corps Programme is a knowledge-based programme in which knowledge empowered teacher-in-charge of Eco-clubs transmits awareness to children through various activities. The NGC Programme involves more than 1,00,000 Eco-Clubs across the country to carry out its mandate.

4.1.5.2. National Museum of Natural History, NMNH

The National Museum of Natural History (NMNH), New Delhi is an institution devoted to conservation of natural heritage and environmental education. The Museum was opened to the public in 1978 on June 5 on the occasion of World Environment Day. The NMNH today is widely recognized for its thematic exhibit galleries and innovative educational programmes and activities to disseminate information on ecology, environment and natural heritage. NMNH has set up regional Natural History Museums (RMNH) at Mysore, Bhopal, Bhubaneswar. one at Sawai Madhopur in Rajasthan is under construction and action has been initiated to set up an RMNH at Sikkim during the 11th Plan.

Construction of building for the Regional Museum of Natural History at Sawai Madhopur (Rajsthan), which would focus on the theme of hot desert ecosystems, is progressing well and is likely to be completed by March 2012. For the Regional Museum of Natural History at Gangtok (Sikkim), preliminary activities have been taken. This museum will showcase the rich biodiversity of the country's North Eastern Region.

4.1.5.3. Centres of Excellence

The scheme aims at strengthening awareness, research and training in priority areas of Environment Science and management. The following Centres of Excellence in designated areas have been set up by the Ministry so far:

- Centre for Environment Education (CEE), Ahmedabad on 'Environment Education'
- CPR Environnent Education Centre (CPREEC), Chennai on 'Environnent Awareness'
- Centre for Ecological Sciences (CES), Bangalore on Ecology of Western Ghats and Research
- Centre for Mining Environment (CME), Indian School of Mines, Dhanbad on 'Mining Environment'
- Salim Ali Centre for Ornithology and Natural History(SACON), Coimbatore on 'Avian Ecology,
- Centre for Environmental Management of Degraded Ecosystem(CEMDE), Delhi University, Delhi on Management of 'Degraded Ecosystem'
- Foundation for Revitalization of local health traditions (FRLHT), Bangalore on 'Medicinal Plants & Traditional Knowledge'
- Madras School of Economics (MSE), Chennai on 'Environmental Economics'
- Tropical Botanic Garden and Research Institute (TBGRI), Thiruvananthapuram on 'Conservation of Tropical Plants,
- Centre for Animals and Environment, CARTMAN, Bangalore to foster Man-Animal-Nature relationship, prevention of cruelty to animals, protection of environment from pollution, conservation of ecology, inculcation of spiritual values in our approach to animals and nature, promoting vegetarianism and animal welfare work.

The level of funding for these 10 Centres of Excellence has been around Rs 8.33 crore for the past couple of years, requiring enhancement in these outlays.

4.1.5.4. Environmental Information System, ENVIS

ENVIS Scheme aims at collection, collation, retrieval and dissemination of environmental information to all concerned. The ENVIS network now comprises of 76 network partners, out of which 46 ENVIS Centres are on specific subject area on environment and its associated fields located in various potential organizations/institutions in the country and the remaining 30 Centres are in various State/UT Government Departments dealing with the status of environment and related issues of the concerned State/UT Government. Besides State of Environment Reports

for country as a whole, state of environment reports for States/UTs and also city levels are also being prepared under the scheme.

4.1.5.5. Information Technology

The Ministry of Environment & Forests has embarked on a comprehensive exercise to implement an e-Governance project titled 'ENVISION' with the objective of applying principles of Good Governance to the management, regulation, and use of environmental resources. This is an outcome based initiative that seeks to bring about a quantum improvement in operational efficiencies of the Ministry as reflected in the National Environmental Policy, 2006.

The basic purpose of 'Envision' is to transform the functioning of the Ministry and its various Departments and Agencies under its purview with the objective of achieving greater transparency and accountability. It also seeks to render services to its various stakeholders with accurate, timely and reliable information and develop a more friendly and hospitable interface with public.

The project adopted three-tier approach in its implementation, viz. conceptualization, Project Development and system integration & Project Implementation, and is currently in its third stage of implementation.

4.1.6. Environmental Management in Heritage Pilgrimage and Tourist Centres including the Taj Protection

The objective of the scheme is to prevent environmental degradation of the area of heritage or pilgrimage importance through proper management and to implement schemes relating to protection of Taj Mahal. In the first phase of Taj protection, 10 projects with a total cost of Rs. 221.21 crore were approved. The scheme was kept on hold pending its independent appraisal during the 11th Plan. The Ministry has accepted the post evaluation report of NEERI, Nagpur. In order to revive the scheme in 12th Plan, the U.P Government has been requested to prepare a Comprehensive Environment Management Plan (EMP) to be integrated with various sectoral projects on the lines of EMP drawn by NEERI in their post evaluation report.

4.1.7. International Cooperation

4.1.7.1. IC Activities

The scheme caters to coordinating all bilateral and multilateral cooperation including *inter alia*, the United Nations Environment Programme (UNEP), South Asia Cooperative Environment Programme (SACEP), follow up of action to the United Nations Conference on Environment and Development (UNCED) including Agenda 21. It also coordinates participation by the Ministry in the meetings/conferences of the Parties of the United Nations Framework Convention on Climate Change (UNFCCC), Biological Diversity, Basel Convention on Trans-boundary Movement of Hazardous Wastes, Convention to Combat Desertification, Montreal Protocol on Substances that deplete Ozone Layer, Meeting of ESCAP, SAARC, ICIMOD and other regional bodies. It also

takes up follow up of MOUs signed with various countries. Annual contributions to various international bodies are also made under this scheme.

4.1.7.2. GOI-UNDP CCF

This Project includes two sub projects: one, relating to Biodiversity conservation through community based natural resource management with the objectives of facilitating the process of making the national and state-level policies and programmes more responsive to linkages between sustainable rural livelihoods and biodiversity conservation, and enhancing the capacity of communities and institutions of decentralized governance for integrating sustainable biodiversity based livelihoods through participatory approach. The project is being implemented in four states namely Arunachal Pradesh, Chhattisgarh, Jharkhand, and Orissa, with a total outlay of approx Rs. 13.50 crores (US$ 3 Million).

The second project under this scheme is "Building stakeholders' capacities and involvement**".** The aim of the project is to achieve sustainable industrialization by influencing industries to voluntarily improve their environmental performance, strengthen the regulatory system, as well as build capacities of local communities to intervene in the industrialization process through an industry- rating programme, capacity building, research and networking. The project aim is to research, advocate, build capacity and create linkages between NGOs, local community, regulators and policy makers, to steer Indian industry and the process of industrialization in India towards sustainability. The total budget for the project is US$ 750,000 under UNDP assistance for duration of 5 years from 2007-2012.

4.1.7.3. Climate change

The scheme had been envisaged mainly to undertake climate change capacity building activities in the country to enable the stakeholders to mainstream climate change concerns in the formulations of developmental strategies, risk assessment and adaptation to address consequences of climate change as well as to enhance awareness in the country and encourage climate friendly development process. The Scheme also addresses India's commitments under the UNFCCC. Given the enhanced scope, wider issues and higher fund requirements for climate change issues, it has been decided to upgrade this scheme into a standalone thematic scheme on Climate Change in the 12th Five Year Plan.

4.1.8. National Coastal Management Programme

National Coastal Management Programme (NCMP), launched in 2010-11 with external aid from the WB, aims at supporting the coastal regulation activities of the Ministry by application of Science and Technology to protect the coastal environment and the livelihood of coastal communities. To achieve the aim of the project the following activities are being initiated; [i] mapping, delineation and demarcation of the hazard lines, and delineation of coastal sediment cells all along the mainland coast of India; [ii] mapping, delineation and demarcation, of the environmentally sensitive areas (ESAs); [iii] capacity building of the MoEF as the secretariat for the National Coastal Zone Management Authority (NCZMA), and nation-wide training program for integrated coastal zone management; [iv] setting up and operationalization of the new

National Centre for Coastal Zone Management; [v] capacity development and pilot investment on ICZM in the State of Gujarat, Orissa and West Bengal.

It is proposed to extend this programme to other coastal states as Phase II of the WB Project and the states have been requested to submit proposals in this regard.

4.1.9. National River Conservation Plan (NRCP)

The main objective of the NRCP is to improve the water quality of polluted stretches of rivers to acceptable standards by preventing pollution load reaching the rivers by undertaking various pollution abatement works. The works include (i) interception & diversion works to capture the raw sewage flowing into the river through open drains and divert them for treatment, (ii) sewage treatment plant for treating the diverted sewage, (iii) low cost sanitation works to prevent open defecation on river banks, (iv) electric and improved wood based crematoria to conserve the use of wood and help in ensuring proper cremation of bodies brought to the burning ghats, (v) river front development such as improvement of bathing ghats and (vi) other minor miscellaneous works such as afforestation etc. The projects are implemented through the State Implementing Agencies with a cost sharing ration of 70:30 between the Centre and the States.

A recent initiative in river conservation includes conferring the status of a 'National River' to Ganga and establishment of a 'National Ganga River Basin Authority' (NGRBA). The NGRBA has been set up as an empowered planning, financing, monitoring and coordinating authority for the conservation of Ganga River with a holistic approach under the Environment (Protection) Act, 1986. The Authority has decided that under Mission Clean Ganga it will be ensured that by 2020 no untreated municipal sewage and industrial effluents flow into Ganga. An Action Plan to achieve this Mission objective has been prepared.

At present the NRCP includes conservation related work in 178 towns along the polluted stretches of 39 rivers spread over 20 states. The total cost of sanctioned projects is about Rs. 6311 crores, against which an amount of Rs 4729 crore have been released till March 2011, with a total sewage treatment capacity of 4417 mld been created.

4.2. Schemes of other Ministries in the sector

The key schemes of the other Ministries which may be overlapping with the mandate of the Ministry of Environment & Forests are:

4.2.1 Restoration of Ponds (MoWR)

A Centrally sponsored scheme of Ministry of Water Resources on a 75:25 sharing basis between Centre and states for repair, renovation and restoration of water bodies was launched in 2005 at an estimated cost of Rs. 300 crore.

4.2.2 Solid waste management

The Ministry of New and Renewable Energy (MNRE) has identified energy recovery from wastes as one of its thrust areas and prepared a National Master Plan (NMP) for the development of a Waste-to-Energy (WTE) programme in India, which has an estimated potential of over 2500 MW (megawatts). At present only about 2% of this potential is tapped with considerable scope for growth of WTE projects.

4.2.3 Jawaharlal Nehru National Urban Renewal Mission

In 2005, the Ministry of Urban Development (MoUD) launched the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) to improve efficiency in urban infrastructure and service delivery mechanisms including solid waste management in selected 65 cities.

4.3 New Schemes

There are 9 thematic schemes being implemented in the Environment & Ecology sector of the Ministry of Environment & Forests. With the acceptance by the Ministry of the independent appraisal report of the scheme of Environment Management in Heritage, Pilgrimage and Tourist centre, including Taj protection, the U.P Government has been requested to prepare a Comprehensive Environment Management Plan on the environment of the TTZ, based on which proposals would be considered for the 12th Five Year Plan. A decision has already been taken, with the approval of the Planning Commission, to *upgrade the Climate Change scheme to stand alone thematic umbrella scheme*. Other changes proposed include the following:

- The Project on "Industrial pollution abatement through preventive strategies" and on "Clean technology" will be merged under the thematic scheme of Pollution Abatement.

- The two Programme on Lake Conservation and the Wetlands will also be merged into one under the umbrella scheme of Conservation of Natural resources and Eco-systems.

The Environment and Ecology sector in the 12th Five Year Plan would thus comprise of 10 thematic schemes, 9 ongoing schemes and one on Climate change.

4.4 Financial allocation and expenditure during 11th Plan

The Environment and Ecology sector of the Ministry of Environment & Forests was approved an outlay of Rs 3801.01 crore, out of a total approved outlay of Rs 10,000 crore for the Ministry's 11th Plan. The annual plan allocations to this sector during the Plan period amounted to Rs 4689.09 crore, against which the likely expenditure for the sector in 11th Plan would be Rs 4386.05 crore, implying a utilization ratio of around 94%. Despite lower allocations approved for this sector in Ministry's total plan (at 38.01%), the actual allocations and utilization was higher at 51% and 49% respectively.

The higher share of this sector in annual allocations/expenditure was mainly on account of additionality coming from EAP projects of National Coastal Management Programme and the Capacity Building for Industrial Pollution Management launched in 2010-11, external funding of NGRBA and launching of Biodiversity Conservation and Rural Livelihood Improvement Project in 2011-12.

Summary of Outlays/Expenditure – Environment & Ecology Sector

Thematic Scheme	**Outlay XI Plan** Rs crore	**2007-08 Outlay/ Expend** Rs crore	**2008-09 Outlay/ Expend** Rs crore	**2009-10 Outlay/ Expend** Rs crore	**2010-11 Outlay/ Expend** Rs crore	**2011-12 Outlay** Rs crore
1. Environmental Monitoring & Governance	216.00	51.20/ 43.43	40.00/ 41.21	40.80/ 38.17	44.50/ 46.33	53.50
2. Pollution Abatement	235.00	19.00/ 19.36	23.00/ 21.78	32.07/ 21.17	49.76/ 29.04	49.76
3. R&D for Conservation & Development	250.00	53.00/ 45.52	60.00/ 58.08	59.21/ 66.98	80.94/ 80.67	68.94
4. Conservation of Natural Resources & Ecosystems	615.00	111.19/ 91.73	113.00/ 75.10	78.00/ 74.82	83.00/ 79.62	83.00
5. Environmental Info, Education & Awareness	295.00	92.26/ 71.08	95.00/ 75.95	94.82/ 72.97	82.33/ 81.89	79.58
6. Taj Protection	0.01	0.01/ 0.00	0.01/ 0.00	0.01/ 0.00	0.01/ 0.00	0.01
7. International Cooperation Activities	80.00	15.40/ 16.78	12.00/ 12.26	19.01/ 22.53	42.63/ 47.03	71.82
8. National Coastal Management Programme	10.00	0.10/0.48	1.37/1.51	15.50/ 1.52	150.00/ 149.40	267.60
9. National River Conservation Plan	2100.00	260.00/ 257.73	260.00/ 281.21	532.33/ 381.72	701.71/ 705.17	701.71
10. Total (1-9)	**3801.01**	**602.16/ 546.11**	**604.38/ 567.10**	**871.75/ 679.88**	**1234.88/ 1219.15**	**1375.92**
Total MOEF- (Environment, Forestry & WL)	**10000.0**	**1351.00/ 1349.73**	**1500.00/ 1483.02**	**1880.00/ 1630.69**	**2200.00/ 2179.71**	**2300.00**

Chapter 5: Institutional setup – Centre and State

5.1 Institutional set up at the Centre and State

The MoEF is the Nodal Agency for implementation of Policies and Programmes relating to environment protection and conservation of the country's natural resources. While implementing these policies and programmes, the Ministry is guided by the principles of sustainable development and protection of human health. Ministry formulates policies and enacts legislation at the national level. Apart from headquarter at New Delhi there are six regional offices at Bangalore, Bhubaneshwar, Shillong, Bhopal, Chandigarh and Lucknow.

5.2 Central Pollution Control Board (CPCB)

CPCB has been established under the Water (Prevention and Control of Pollution) Act, in November 1974 to implement the nation-wide programme on abatement of pollution. After the enactment of the Air (Prevention and Control of Pollution) Act, 1981, CPCB is also mandated with the responsibility of prevention and control of air pollution in the country. The emission/discharge standards are notified under the Environment Protection Act, 1981 for their implementation through SPCBs. The CPCB coordinates with the SPCBs/PCCs on matters pertaining to prevention and control of pollution in the country. The CPCB undertakes random inspections for verifying compliance by the industries to the pollution control norms. The CPCB also issues directions under Section 18 (i) (b) of the Water and Air Acts to the State Boards and also issues show cause and closure notices to the non-compliant industries under Section 5 of the E(P)Act.

5.3 State department of Environment and SPCB/PCCs

SPCBs/PCCs are also constituted under the Water Act with the main mandated functions of prevention and control of water pollution in their respective States/UTs as per the provisions of the Act. The SPCBs/PCCs are given responsibilities of prevention and control of air pollution under the Air Act. The State/UT Governments are required to review the functioning of the SPCBs/PCCs and also to strengthen them to achieve the objectives envisaged under Water and Air Acts. SPCBs/PCCs implement the standards with respect to industries and local bodies as notified under the EPA through a mechanism of issue of consent and authorization. The monitoring of stipulated norms is carried out by SPCBs/PCCs and their zonal offices through inspections. The SPCBs/PCCs issue directions under Section 33A and 31A of the Water Act and the Air Act, respectively to the defaulting unit.

5.4 Assessment of Boards, Authorities and institutions attached to the MoEF

The performance of CPCB/SPCBs has been reviewed from time-to-time. The functioning of CPCB has been evaluated by the IIM, Lucknow which submitted its report in July 2010. The report has recommended strengthening in four core areas - Staffing, Computerization, Infrastructure and Upgradation of laboratories accredited with NABL certification. Following the recommendations, measures such as appointing additional scientific and technical manpower, enhancement of capacity in terms of laboratories, computerization, and infrastructure are being undertaken by providing funds from cess proceeds.

The SPCBs/PCCs are autonomous bodies of the State Governments and therefore concerned State Government has statutory responsibility to support them for achieving the objectives envisaged under the Water Act, 1974, Air Act, 1981 as well as Environment (Protection) Act, 1986. So far, most of the State Governments are unable to fulfill their statutory obligations towards SPCBs/PCCs. Barring 3 States, no State provides any financial assistance to support SPCBs/PCCs. The most affected SPCBs are from North-Eastern States which do not have any revenue source either from consent/authorization fee or proceeds from the cess as compared to SPCBs/PCCs of industrialized States. There is therefore urgent need for augmenting the resources of the weaker Boards particularly from the NE States.

In addition, at MoEF, the Ganga Project Directorate (GPD) was set up to service implementation of the Ganga Action Plan (GAP) which was launched in 1985 for pollution abatement of the river Ganga. Later when the Plan was expanded to cover other rivers under National River Conservation Plan (NRCP), the GPD was renamed as National River Conservation Directorate (NRCD).

The approach adopted for river cleaning has been revisited in the light of experience gained under NRCP. As a result, a need for strengthening the system was felt. Accordingly, as a part of a revamped conservation strategy, the Government has set up in February 2009, the 'National Ganga River Basin Authority' (NGRBA) under the E (P) Act, 1986, as an empowered planning, financing, monitoring and coordinating authority, for effective abatement of pollution and conservation of the river Ganga with a holistic river basin approach and to maintain minimum ecological flows. The Authority is headed by the Prime Minister with Union Ministers concerned, Chief Ministers of five main-stem Ganga States and experts as members. The NGRBA has started working as a collaborative endeavour of the Central and State Governments and with significant involvement of members representing civil society and different areas of specialisation. A standing committee chaired by the Finance Minister with Union Ministers concerned and Chief Minister of the 5 NGRBA States monitors the implementation of directions given by the NGRBA. A National mission for clean Ganga has been registered as a society.

Several measures have been taken to improve implementation of projects under NGRBA, which include; (i) Constitution of State level Empowered State River Conservation Authorities (SRCAs) in the five Ganga States, (ii) Setting up of Dedicated implementation institutions in centre and States, (iii) Signing of Tripartite Memorandum of Agreements (MoAs) with the State Governments/Urban Local Bodies, (iv) Independent Appraisal of Detailed Project Reports by reputed professional/ academic institutions, (v) Third Party Inspection for projects under NGRBA, (vi) Setting up of a dedicated cell in CPCB for inspection and monitoring of industrial units discharging effluents into the river Ganga (vii) capacity building of the SPCBs and ULBs for effective management and monitoring of pollution in river

For conservation and management of polluted and degraded lakes in urban and semi-urban areas of the country, the Ministry is implementing the Centrally Sponsored Scheme of National Lake Conservation Plan (NLCP) on 70:30 funding pattern. For proper and timely implementation of NLCP projects, the concerned State Governments are to ensure availability of a 3-tier institutional mechanism as following:

- The State Government must identify a nodal department in the state for all interactions with MoEF, receipt and disbursement of funds, physical and financial monitoring of project implementation. Lake Development/Conservation Authority (LDA/LCA), if already existing at State level, shall be the nodal department/agency,
- A Project implementation Unit (PIU) with requisite expert manpower may undertake/ oversee the project implementation ensuring no time and cost overruns,
- The agency owning the lake (Municipal Council/Corporation/local body) may undertake the O&M of the lake and be equipped with dedicated human resources. In case of multiple agency structure, the concerned District Collector/Commissioner are authorized to take the O&M responsibility,

5.5 Recommendations for the 12th Five Year Plan

- A more inclusive dialogue is required between the Central Environmental Agencies and SPCBs for coordinated actions and dissemination of information
- Increasing the number of regional offices for MoEF and CPCB and providing them with necessary infrastructure including NABL accredited laboratories. Commensurate increase in manpower and holistic capacity building of staff at various levels in CPCB/SPCBs/PCCs by imparting specialized and general training in the environment management
- The State Governments statutorily required to support SPCBs/PCCs. In particular, weaker SPCBs/PCCs should get budgetary support.
- Capacity building of SPCBs to be supplemented with constitution of committees comprising of domain experts, scientists, economists, etc.
- Consent management at the SPCB level may be made more transparent and expeditious though

    - Inviting experts on case-to-case basis to assists consent management committee
    - To delegate power as deemed appropriate to regional offices of SPCBs
- The scheme of assistance for abatement of pollution to be targeted to support the weaker SPCBs/PCCs particularly of NE States
- The rates levied under the Water Cess Act, 1977 may be revised upwardly to augment the resources for SPCBs/PCCs in view of growing responsibilities.
- The Central and State Governments to consider creation of creation of adequate number of technical posts
- Enhancement infrastructure in terms of office-cum laboratory building of CPCB/SPCBs/PCCs including zonal offices as the case may be
- Zonal labs and lab at headquarters should be accredited with NABL or ISO 9001 and ISO 17025
- Encouraging ULBs to develop PPP model for creating infrastructure to ensure O&M of STPs and other assets created

Chapter 6: Air pollution and air quality management

Deterioration of air quality has been a matter of concern in the backdrop of increasing urbanization, industrialization and vehicular pollution. Air pollution is not only a problem in urban regions but also in rural areas where indoor air pollution caused due to usage of biomass fuel is a major concern. For air quality management, various actions like an integrated approach for strengthening of monitoring networks, enforcement of emission standards for both point and non-point sources, drafting and implementation of air quality management plans, carrying out research and development for air pollution control and formulation of a National strategy for urban transport and energy conservation, have been suggested in National Environment Policy (NEP) 2006.

The 11th Plan had in-built two targets concerning air pollution: i) a monitorable socio-economic target to attain WHO guidelines of air quality in all major cities by 2011-12 and; ii) a physical target, i.e., to increase the number of ambient air quality monitoring stations from 319 to 700 under National Air quality Monitoring Programme (NAMP).

In major cities, there are multiple air polluting sources viz. vehicles, industries, power plants, generator sets, construction activities, etc. with varying extent of contributions. However, in order to achieve desired air quality, emissions from different source groups need to be controlled. These sources and the actions required to reduce their emissions are under administrative purview of different Ministries and different tier of Government, i.e. there is inter-sectorality involved in adopting mitigative measures.

6.1 Overview of current air quality trends and challenges

Under the NAMP, Central Pollution Control Board is regularly monitoring criteria pollutants such as PM10, SO_2 and NOx at 411 monitoring stations across 167 cities in the country. Monitoring has also been carried out for other pollutants like PM2.5, Ammonia, Ozone, Carbon monoxide, Hydrocarbons (Benzene Toluene and Xylene), Poly-aromatic hydrocarbons (PAH) at selected locations in the country. Analysis of long term trends (1995-2009) of air pollutants show that while SO_2 has been under control, NOx has exceeded in 11-23% cities during last 15 years. RSPM has consistently remained a major concern for the country as 82-100% cities exceeded the standards in last 10 years (1999-2009).

Current, air quality data for the year 2010 reveals that the annual average concentration of SO_2 is within the limit (50 µg/m^3), while levels of NO2 have exceeded the limit (40 µg/m^3) in Asansol, Dhanbad, Delhi, Jamshedpur, Kolkata, Meerut and Mumbai. The annual average standard of PM10 (annual average – 60 µg/m^3) was exceeded in most of the cities, except Chennai, Kochi and Madurai during 2010.

Rise in vehicular fleet has caused an increase in the NOx concentrations at most of the urban centres, which makes this an emerging pollutant of concern for future. Although, currently, the

levels are below the air quality standard but have shown an increasing trend in last few years. It is even more important to control NOx due to its ground level Ozone forming capability, which has implications not only over the human health but also on crop productivity. Hence, there is also a need to develop capacity for monitoring and modelling of Ozone concentrations at urban centres.

6.2 Air quality management

The number of air monitoring stations were 295 and 319, respectively at the end of IX and X Plan. This network has to grow to 500 stations during 11th Plan. Additionally, 46 continuous ambient air quality monitoring stations (CAAQMS) have also been installed across 28 cities and towns. Few public sector companies like NTPC, Coal India, SAIL, petroleum refineries, ONGC, etc. have also installed CAAQMS in their units.

Ambient air quality

With growing concerns about air pollution levels, the National Ambient Air Quality standards (NAAQS) have been revised in 2009. According to the revised standards, industrial areas will have to conform to the same standards as the residential areas. The previous standards for the residential areas have been uniformly applied for fine particulate matter (PM10), carbon monoxide, and ammonia, while more stringent limits for lead, SO2 and NO2 have been prescribed. Other new parameters such as ozone, arsenic, nickel, benzene, and benzo(a)pyrene have been included for the first time under NAAQS based on CPCB/IIT research, World Health Organization (WHO) guidelines and European Union (EU) limits and practices.

For controlling stack emissions, standards have been revised for 8 categories of industries, and notified afresh for 14 categories of industry[1] during the 11th Plan period.

For attainment of the NAAQS, interventions were taken at central, state and city level. While centrally, vehicular emissions and fuel quality norms have been raised to BS-IV in 13 cities and BS-III in rest of India; introduction of cleaner fuels, improvement in public transport (both MRTS and bus based), shift towards gas based power generation have been some actions taken at State level. Some local measures taken at the city level include re-location of industries; plying restrictions for polluting vehicles, traffic management, etc. However, rise in activity levels including growth in population, number of vehicles and industrial production have negated the effects of interventions.

[1] Sponge iron, common hazardous waste incinerators, coffee , refractories, incinerator for pharmaceutical industries, brick klins, hotel industry, cashew seeds processing, plaster of paris industry, incinerator for pesticides industries, incinerator for dye and dye intermediate industries, incinerator of organic chemicals manufacturing , iron ore mining and ore processing, rubber products industries.

Recently, source apportionment studies were carried out in 6 cities of the country to ascertain the sectoral contributions to the prevailing RSPM concentrations. City specific action plans have been prepared for attainment of NAAQS in these cities. Significant experience gained through the source apportionment studies by the CPCB and other research institutions during the 11th Plan could be utilized for efficient management of air quality in other cities of the country.

While mega cities and CPAs (critically polluted area) require more focused and effective measures to stay ahead of the problem, the smaller cities and towns will also need more preventive action to avert the problem.

Present network for air monitoring covers mega cities, metro cities, other important cities & towns and industrial areas wherein CPCB or SPCBs have their headquarters and regional or zonal offices.

While MoEF has a key role to play in air quality management, other Ministries like MoPNG (Ministry of Petroleum and Natural Gas), MoRTH (Ministry of Road Transport and Highways), MoUD (Ministry of Urban Development), MoCI (Ministry of Commerce and Industries), MoP (Ministry of Power), MoC (Ministry of Coal), etc. need to work in an integrated manner for implementation of action plans drafted for improvement of air quality in the urban centres.

Indoor air quality

For improvement of indoor air quality in rural households, few interventions were taken in past. National Programme on Improved Chulha (NPIC) was launched, although with limited success. It is observed that there is need for further research in developing core biomass based combustion technology options along with development of more efficient processed fuels that have relatively higher calorific value and produce less smoke. The government has also been supporting biogas use through the National Programme on Biogas Development (NPBD). However, the rate of progress is very slow and the growth rate has been declining since its inception. There were also some efforts made in promotion of renewable technologies. Given the inefficiencies and health implications associated with the use of kerosene for lighting; redirecting kerosene subsidies towards the provision of solar lanterns in rural areas, could be considered.

Noise Pollution

Along with rising air pollutant concentrations, noise levels have also risen many folds in the urban centres across the country. A National Committee on Noise Pollution Control has been constituted in Central Pollution Control Board for advising on the issues concerning noise. Apart from evolving ambient noise standards, noise limits for automobiles, sound making fire crackers, generator sets and domestic appliances have been notified.

The ‘noise’ has been included in the definition of ‘air pollutant’ through an amendment in the Air (Prevention and Control of Pollution) Act, 1981. The EP Act, 1986 has inbuilt provisions to take measures to deal with various types of pollution including noise pollution. Noise Pollution (Regulation and Control) Rules, 2000 deal with sources of noise other than industry.

Through amendment to Noise Rules during January, 2010, stress has been laid on making the night peaceful. The ‘night time’ has been defined and restrictions have been imposed on the use of horns, sound emitting construction equipment and bursting of fire crackers during night time. Till now, CPCB/SPCBs have been carrying out sporadic or isolated noise monitoring in urban areas. A state-of-art National Ambient Noise Monitoring Network on the pattern of existing air and water quality monitoring networks has been established during 11^{th} Plan in the country and a roadmap for its further extension has been prepared for 12^{th} Plan. Development of noise monitoring and reporting protocols and setting up of 70 noise monitoring stations in seven cities, namely Delhi, Kolkata, Mumbai, Chennai, Bengaluru, Hyderabad and Lucknow has already been completed. The monitoring network will be extended upto 160 stations in 25 cities, i.e. establishing 90 new stations covering 18 new cities/towns in 18 States/UTs as per the roadmap for 12^{th} Plan.

Key issues of concern and gaps

While lot of efforts have already been made for reduction of source-specific emissions and improvement of air quality, the demographic and economic growth rates have negated the effect of interventions taken for air pollution control. A more integrated and strategic action plan would be required to bring the air pollutant levels within the NAAQS and further within the WHO guidelines. Following gaps are identified which need to be plugged for efficient management of air quality in the country:

a. Emission inventory of sources: There is a need for development of a GIS based sector-wise and pollutant wise database of emission inventory for the country. This will not only help in solving air quality issues at local level but also at regional scale.
b. Limited ambient air quality monitoring network: Air quality network is presently insufficient not only in terms of number of stations but also in the parameters needs to be monitored. Only 3 criteria pollutants are regularly monitored at all the stations as against 12 specified in the revised NAAQS.
c. Limited stack emission standards: Major focus of stack emission standards for industries lies on control of SPM and SO_2 emissions. There is absence of standards for other important pollutants such as PM10, PM2.5 and NOx, which could be a major lacuna in achieving the NAAQS. Also, the standards focus more on the quality rather than the total emission load which is emitted in the atmosphere.

d. No road map for further advancement of vehicular emission/fuel quality norms: After the introduction of BS-IV standards in 13 cities and BS-III in whole of the country, there is a need to develop road map for advancement of these norms in the 12th Plan.
e. Lack of public transport system: Inefficient public transport system in the cities of the country has led to the phenomenal growth of private vehicles, which subsequently led to higher congestion and air pollutant concentrations.
f. Limited attention towards indoor air quality: While a number of interventions were taken to improve ambient air quality, limited efforts are being made to improve air quality within the rural households, where more than 85% people use biomass for cooking.

6.3 Health risk assessment

Comprehensively designed health assessment studies are needed to understand the magnitude of health risk, and make regulations responsive and dynamic to reduce them. More robust local data would help to evolve necessary action and enable decision- making process.

Ministry of Environment and Forests has initiated a few projects and constituted a committee to review the current status of environmental health. An Environmental Health Cell has been set up, which is formulating and implementing health impact related projects. A vision statement on environment and human health released by the MoEF in July 2003 stressed on the need for environmental health risk assessments studies due to air pollution. Environmental epidemiological studies have already been initiated in 11 areas. These studies are at various stages and would help in further refinement of the existing standards and development of future standards. A thrust may be required to integrate this information in decision making.

6.4 Training and capacity building

CPCB is being strengthened in terms of manpower, computerization, up-gradation of laboratories, and preparation of environmental database on GIS/GPS platform, infrastructure in terms of training facilities, vehicles and building. However, the capacity building and training requirements are even more pronounced at the State level, and even more attention is required to conduct country wide trainings and workshops for effective handling of air quality issues at the local level.

One of the key aspirational goals for the 12th Plan will be to meet the new NAAQS adopted by the Government which calls for appropriate air quality monitoring programme for 12 pollutants. Hence, there is need to give special attention for capacity building linked with air quality monitoring and modeling, instrumentation, laboratory analysis, calibration and quality audits. Protocols for monitoring and data handling and road map for strengthening the monitoring network is required to be developed.

6.5 Research and Development

There is immense scope of R&D activities in the field including the following:

a. Understanding the share of different sources: Scientific evaluation of contribution of different sources towards prevailing pollutant concentrations is required at city level for drafting sector-specific strategies for emission control.
b. Modelling of air pollutants: Understanding of different roles played by various pollutants and their interactions needs to be understood using state of the art 3-d air quality modelling techniques for drafting air quality policies not only at urban but also at regional scale.
c. Research on emerging pollutants: Revised NAAQS included new pollutants like PM2.5, Ozone, Benzene etc and tremendous research is required for understanding the pollutants their sources, and control measures.
d. Research on source monitoring of VOC, BTEX and toxic heavy metals may be initiated to develop mitigation and preventive measures.
e. CPCB and SPCBs may develop and strengthen the protocols for monitoring personal exposure to indoor air pollution in urban and rural households
f. Epidemiological studies to assess the health impacts and evaluation of the economic costs and benefits to support mitigation measures. Considering, human health as a significant issue, Ministry of Health should primarily support the research studies.

6.6 Recommendations for the 12th Plan

- Respective ministries dealing with urban air quality issues to mainstream environmental concerns in 12th Five Year Plan
- Air quality monitoring network to be strengthened both in terms of number of stations as well as the parameters in order to undertake monitoring as per the revised NAAQS. The monitoring network should be linked with existing monitoring stations of IMD.
- Continuous monitoring of action plan in 43 CPAs
- Emphasis on R&D for introduction of more efficient and cost-effective technologies in polluting industrial sectors
- City specific air quality management plan to be prepared for million plus polluted cities by the respective SPCBs and these plans to be monitored at city, state government and CPCB levels.
- Efforts need to be made for universalising BS-IV fuel across the country
- Fiscal incentives should be introduced to promote alternate fuels (biofuel), electric vehicles and advanced vehicular technologies like hybrid vehicles.
- Introduction of noise standards for off-road vehicles, earthmoving equipment and other appliances.
- Health impacts of air pollutants should be assessed with the involvement of MoH&FW and ICMR

Chapter 7: Water Pollution and Abatement Measures

Water pollution has become a global problem and would intensify over time due to rising domestic, industrial and agricultural demands. With the goal to combat water pollution by restoring the quality of water in all natural water bodies to a level which can support human use and function of ecosystem, a target to treat all urban wastewater by 2011-12 was set in the 11th Plan.

7.1 Overview of current water quality trends and challenges

The CPCB has established a network of monitoring stations on water bodies and rivers across the country, comprising of 2000 stations spread over the country. The parameters monitored for water quality include physical parameters, nutrients, major ions, and organic and pathogenic pollution. CPCB has identified 150 polluted stretches of rivers in the country in five priority categories depending upon the risk, i.e., degree/frequency of violation with respect to water quality criteria.

Overall, analysis of monitoring results indicates that the organic and bacterial contaminations are the critical parameters in water bodies responsible for water quality degradation. Presently, it is observed that about 60% of the observations meet the desired level of BOD (less than 3 mg/l) whereas 40% exceed the criteria. Similarly, fecal and total coliform which indicate presence of pathogens in water are also a major concern. About 46% observations of total coliform and 68% observations of fecal coliform meet the desired level of 500 MPN/100 ml which is largely responsible for water borne diseases.

All major rivers are not meeting the desired criteria in segments with respect to one or the other parameter such as BOD, fecal coliform and total coliform. Out of total riverine length of approximately 45000 kms in our country, 14% of riverine length is severely polluted (BOD more than 6 mg/l), and 19% is moderately polluted (BOD 3-6 mg/l). The increasing trend of pollution is observed in river Ganga, Brahamputra, Subranrekha, Mahi, Tapi and Narmada whereas decreasing trend is observed in Yamuna, Beas, Satluj, Sabarmati, Baitarni, Brahmani, Mahanadi, Godavari, Krishna, Cauvery and Pennar with respect to organic pollution.

The quality of groundwater observed through half yearly monitoring under the National Water Quality Monitoring Programme of the CPCB indicates that salinity and organic pollution is above the desired levels for beneficial uses in Andhra Pradesh, Assam, Pondicherry, Maharashtra, Madhya Pradesh, Gujarat, Rajasthan, Daman & Dadra Nagar Haveli and Uttar Pradesh. Bacterial pollution is also observed in localized pockets in the vicinity of urban centers, while nitrate concentration is observed higher than the desired criteria in Andhra Pradesh and Pondicherry.

The main sources of water pollution in the country are municipal sewage, effluents generated from industrial processes, agricultural run-off contaminated with fertilizers and pesticides, etc.

Industrial effluents: In industrial clusters in the country, only 1/6th of the capacity required for the treatment of effluents exists. The problem is worse in the case of small scale industries because of their capacity limitations and financial constraints. This would require installation of adequate number of Common Effluent Treatment Plants (CETPs). Most of the major industries have effluent treatment plants for industrial effluents, but running with limited efficiencies. Better operation and maintenance and enforcement mechanisms are required to meet the stipulated standards.

Municipal sewage: As reported by the CPCB, against an estimated sewage generation of about 38254 million litres per day (MLD) from Class I cities and Class II towns of the country, the available treatment capacity is for 11787 MLD, which is only 31% of the sewage generated. Inefficiencies and under-utilization of existing sewage treatment infrastructure further adds to the problem.

Agricultural wastewater: Routine application of fertilizers and pesticides for agriculture and runoff generated is increasingly being recognized as significant source of water pollution. Sediments (loose soil) washed off the fields is the largest source of non-point agricultural pollution, which needs to be controlled through erosion control techniques to reduce runoff flows and retain soil on the fields. In order to address the above mentioned issues of water pollution, several Ministries are involved. MoEF, under the National River Conservation Plan, supplements the efforts of the State Governments in augmenting the sewerage and sewage treatment infrastructures. Ministry of Urban Development facilitates setting up sewage treatment facilities under the Jawaharlal Nehru National Urban Renewable Mission (JNNURM) and other schemes such as Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT). Urban local bodies also have a key role to play in treating the municipal sewage. An integrated and well-coordinated approach among various agencies is required to be followed for effectively addressing this issue which is intersectoral in nature.

7.2 Performance during 11th Plan Period

7.2.1 Water Quality Monitoring

During the 11th Plan, the monitoring network was strengthened and stations increased from 1019 to 2000. New parameters viz. some toxic metals and chlorinated pesticides were included.

7.2.2 Enhancement of sewage treatment capacity

Treatment capacity of 1506 mld has been added in the first four years of the 11th Plan and 300 mld capacity is targeted to be created during the last year (2011-12) of the 11th Plan under NRCP.

7.2.3 Establishment of Common Effluent Treatment Plants (CETPs)

There are about 3.5 million small scale industries and about 2000 industrial estates in India. Keeping in view the key role played by SSI units and their constraints in complying with pollution control norms individually, the MoEF has initiated an innovative support scheme to promote common facilities for treatment of effluents generated from SSIs units located in clusters. During the 11th Plan, 11 CETPs have been financially supported by GoI. A capacity to treat 142 mld of industrial wastewater has been created.

7.2.4 Notifications of the environmental standards

The MoEF has notified 42 categories of effluent standards under E (P) Act, 1986 so far. Of these, 13 no. of standards were notified/revised during the 11th Plan.

7.2.5 Coastal Water Pollution

Municipal sewage is the major source of pollution from the land based activities in the coastal water. Of the 120 Class-I cities and Class-II towns of coastal area, about 6835 mld of wastewater is generated per day, out of which 1492 mld of wastewater gets various level of treatment. Still, the remaining quantity is being discharged without any kind of treatment to the coastal water. Industrial clusters along the coast are another major source of pollution.

Despite the measures taken during 11th Plan, the concerns which remain unaddressed are as follows:

a) Untreated sewage and industrial wastewater received by water bodies
b) Operation and management issues related to STPs and CETPs
c) Management of sludge generated from STPs and CETPs
d) Non-point source pollution of water bodies/soil by agricultural run off
e) Pollution by land discharge of treated effluent

7.3 New scheme and programs for the 12th five year plan

7.3.1 Recasting the scheme of CETPs

In light of the operational deficiencies in the existing scheme of CETPs, the extant guidelines of CETPs are proposed to be revised for enforcement during the 12th Plan period. CPCB has initiated a study for “Inventorization of industrial clusters in the country and assessment of the unmet demand for CETPs”. Based on the recommendations a prioritised list of required CETPs will be prepared.

7.3.2 Enhancement of sewage treatment capacity

During the 12th Plan concerted efforts would be made to complete the ongoing works of the 11th Plan under NRCP/NGRBA/NLCP. For effective enhancement of the capacity, requisite funds need to be made available either under the JNNURM/UIDSSMT and/ or under National River Conservation Plan. Technical and financial capacity of ULBs will also have to be suitably augmented for meeting both the capital and O&M requirements. States are also required to earmark allocations/mobilise necessary resources for funding sewerage infrastructure and their maintenance.

7.3.3 Operation and maintenance of existing infrastructure

The municipal and urban sector reforms need to be considered by the States/ULBs. For projects along the main stem of the Ganga, sharing of O&M costs of assets created on a 70:30 ratio for a period of 5 years will be implemented in the 12th Plan. Performance bench-marking for STPs, pumping stations etc. for NGRBA projects will be introduced for improved O&M of assets.

7.4 Wetlands and Lakes

There were three schemes grouped under NRCP (National River Conservation Plan) which included National Lake Conservation Programme. 21 urban lakes have been initially identified under the program. The objective of the scheme is to restore and conserve the urban and semi-urban lakes of the country degraded due to waste water discharge into the lake and other unique freshwater eco systems, through an integrated ecosystem approach.

As per some of the studies, wetlands in our country are disappearing at a rate of 2% to 3% every year. Some of the major threats to wetlands include rapid urbanization, industries, road construction, resource extraction and dredge disposal, agricultural activities, deforestation, unrestricted dumping of sewage, solid wastes and toxic chemicals, salinization, shift in climatic patterns etc.

According to the Directory of Asian Wetlands (1989), India has totally 27,403 wetlands, of which 23,444 are inland wetlands and 3,959 are coastal wetlands. Government of India has been implementing the National Wetlands Conservation Programme (NWCP) in close collaboration with the State/UT Governments since the year 1985-86. Under the Programme, 115 wetlands have been identified initially which require urgent conservation and management interventions. Financial assistance under NWCP is provided for two components i.e. for implementation of the Management Action Plan and undertaking research projects.

In 2010, the MoEF notified the Wetlands (Conservation and Management) Rules for conservation and management of wetlands and to stop their degradation. The Wetlands Rules,

2010, ban activities like industrialization, construction and dumping of untreated waste near wetlands.

The government set up the wetland regulatory authority and appraisal committee at the district, state and central levels to ensure the proper implementation of the Wetlands (Conservation and Management) Rules.

As per the latest recommendations of Expenditure Finance Committee, **merger of NWCP and NLCP schemes into one integrated scheme entitled 'National Plan for Conservation of Aquatic Eco-Systems' (NPCA)** is proposed with effect from 12th Plan Period i.e. 1st April, 2012, with the objective of conserving aquatic ecosystems namely, lakes and wetlands through implementation of sustainable conservation plans. The merged scheme is proposed to be implemented by National River Conservation Directorate in the MoEF in a Mission mode with target oriented implementation.

7.5 Research and development

Research and development activities are required in the following sub-fields:

a) Development of less energy-intensive technologies for wastewater treatment
b) Conversion of wastewater sludge into useful non-polluting material
c) Developing waste water recycling techniques
d) Waste water modelling studies to draft strategies for improving quality of water bodies
e) Studies to control pollution from non-point sources including agricultural runoffs.

7.6 Recommendations for the 12th Plan

- Efficiency in utilization of created sewage treatment capacity needs to be enhanced
- Need for enhancing financial allocation in view of large gap between sewage generation and available treatment capacity
- Addition of unmet need for new CETPs and upgradation of existing ones should be taken on mission mode
- Introduce the PPP model in creation of STPs and improving the efficiency and maintenance of assets during the operational stage
- Operation and maintenance of STPs and CETPs needs to be strengthened in terms of managerial, financial and technical aspects. State governments and ULBs need to focus on implementing governance reforms to improve revenues of ULB. Operation of CETPs through a SPV (special purpose vehicle) should be promoted
- Progressive cost-effective technologies should be promoted to achieve low/zero discharge or recycling of wastewater from industries/ CETPs
- Identification of sources of pollution along the coastline should be undertaken to address the pollution caused

- Policy to be framed for using the sludge generated from CETPs either as manure or source of energy in line with 3R principle
- MoEF will work in collaboration with ICAR/MoA in promoting bio-pesticides/bio-fertilizers to minimize the pollution generated due to use of chemical fertilizers and pesticides in agriculture
- Efforts to maintain minimum ecological flows to address the issue of river water quality
- Exploring the possibility of introduction of cost-effective technologies such as bioremediation to address the pollution of water bodies
- Address depletion of mangroves to manage the health of coastal areas

Chapter 8: Solid waste management

8.1 Municipal Solid Waste

Municipal Solid Waste (MSW) generation is predominantly an urban problem, which has exacerbated over the years due to changing lifestyles and increasing consumerism resulting from rapid urbanization. The complex nature of the waste and rising levels with inefficient collection, processing, and disposal are posing threat to environment that is impacting the health of humans as well as the ecosystem. With the pressure on waste management agencies to perform with little finance and public participation, sustainability of these services has become a critical issue. There is a need thus to set up adequate waste collection, processing, and disposal facilities.

The NEP 2006 accords high priority to municipal solid waste management. The action plan suggested includes the following:

- Strengthen the capacities of local bodies for segregation, recycling, and reuse of municipal solid wastes
- Give legal recognition to, and strengthen the informal sector systems of collection and recycling of various materials. In particular enhance their access to institutional finance and relevant technologies
- Promote biodegradable and recyclable substitutes for non-biodegradable materials; develop and implement strategies for their recycle, reuse, and final environmentally benign disposal, including through promotion of relevant technologies; and use of incentive based instruments

8.1.1 Current status, trends and challenges

As per CPCB estimates, around 57 million tonnes per annum of MSW is presently generated in the country. Based on its physico-chemical characteristics, the MSW generated in Indian cities is suitable for composting. At present, the country has a rated capacity of processing around 6000 tonnes per day of mixed waste into compost. However, the efficiency of the compost plants needs to be enhanced for them to become competitive.

Although nearly 60% of plastic waste is recycled, the management of certain types of plastics like thin polythene bags and PET bottles still remains a matter of concern due to low collection efficiency.

The indiscriminate littering and dumping of waste causes severe health risk to people, either through direct exposure or indirectly through contamination of surface and groundwater. The unsanitary disposal sites become prolific breeding grounds for insects and rodents, which act as disease vectors. Burning of garbage in open dumps causes air pollution leading to release of certain extremely hazardous persistent organic pollutants such as dioxins and furans. Solid waste dumps also impact the global environment by releasing methane, which is a highly potent

greenhouse gas. Besides environmental concerns, the social dimension of the problem also needs due attention. Solid waste disposal sites in India are often a source of livelihood for the urban poor, who locate their residences in proximity to these sites, making them highly susceptible to health disorders.

Despite the notification of MSW Rules as early as in the year 2000, the local bodies are still not being able to achieve satisfactory source segregation of MSW. The MoEF has also notified the Plastic Waste (Management and Handling) Rules, 2011 (amended on 02.07.2011) which, inter-alia, require municipal authorities to set up, operationalise and coordinate the waste management system and ensure proper collection, storage, segregation, transportation, processing and disposal of plastic waste.

8.1.2 Performance during the 11th Plan

To enable cities to invest in solid waste infrastructure, a Centrally Sponsored Scheme of Ministry of Urban Development (MoUD) titled 'Jawaharlal Nehru National Urban Renewal Mission was launched in 2005. In this scheme under the Urban Infrastructure and Governance (UIG) component, part-financial assistance is provided to 65 mission cities for improvement in water supply, sewerage, solid waste management, and roads. The smaller and medium cities and towns are covered in another component called Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT).

Mid-term review of the programme reveals that as the first national flagship programme for addressing urbanization, JNNURM has been effective in renewing focus on the urban sector across the country and has helped create a facilitative environment for critical reforms in many states. Investment on the solid waste management systems however is still not high on the city agenda due to poor cost recovery.

In addition to MoUD, Ministry of New and Renewable Energy (MNRE) has drawn up a road map to promote waste-to-energy projects in the country including projects processing MSW. The experience of MNRE so far has not been good with the mixed MSW due to operational problems relating to inability to segregate the organic waste.

8 MoEF's mandate is to put in place the regulatory structure for effective management of Municipal Solid Waste in the country. Through CPCB and SPCBs the Ministry monitors implementation of Municipal Solid Waste (Management and Handling) Rules, 2000. The responsibility for establishing the infrastructure for collection, segregation, storage, transportation, processing, and disposal of Municipal Solid Waste is that of urban local bodies. In this, the Ministry of Urban Development and State Urban Development departments need to provide assistance to the urban local bodies through Central Sector Scheme and State Sector Scheme.

8.2 Hazardous Waste and Biomedical waste

Hazardous Waste means any waste that, by reason of its physical, chemical, reactive, toxic, flammable, explosive, corrosive of infectious characteristics, causes danger or is likely to cause danger to health or the environment, whether by itself or in contact with other wastes or substances. These wastes require careful handling, treatment and disposal due to their complex multiphasic nature and hazard.

8.2.1 Current status, trends and challenges

As per the estimates of CPCB, annually around 7.66 million Metric Ton (MT) of hazardous waste is generated from 40,000 industries in the country, of which landfillable waste is 3.39 million MT (44.26%), incinerable 0.65 million MT (8.50%) and recyclable hazardous waste is 3.61 million MT (47.13%).

The mechanism of disposal of hazardous wastes lacks proper enforcement resulting in abandoned hazardous waste dumps. These abandoned disposal sites have the potential to cause soil and groundwater contamination due to heavy metals and other toxic compounds, some of which bio-accumulate through the food chain, thereby posing long-term health risks.

The NEP, 2006 accords high priority to hazardous waste management. The action plan on management of solid waste includes the following:

- Develop and implement viable models of public-private-partnerships for setting up and operating secure landfills, incinerators, and other appropriate techniques for the treatment and disposal of industrial and biomedical waste.
- Develop and implement strategies for cleanup of toxic and hazardous waste dump legacies, in particular in industrial areas, and abandoned mines, and reclamation of such lands for future, sustainable use
- Survey and develop a national inventory of toxic and hazardous waste dumps, and an online monitoring system for movement of hazardous wastes. Strengthen capacities of institutions responsible for monitoring and enforcement in respect of toxic and hazardous wastes
- Strengthen the legal arrangements and response measures for addressing emergencies arising out of transportation, handling, and disposal of hazardous wastes, as part of the chemical accidents regime

Bio-Medical Waste: For proper management of Bio-Medical Wastes (BMW) generated in the country, the Ministry of Environment & Forests notified the Bio-Medical Wastes (Management and Handling) Rules in 1998, under the Environment (Protection) Act, 1986. Three amendments have been issued so far.

The Bio-Medical Wastes (Management & Handling) Rules, 1998 provides for segregation, packaging, storage, transportation, treatment and disposal of the bio-medical wastes. As per these

Rules, it shall be the duty of every occupier of an institution generating BMW, to take all steps to ensure that such waste is handled without any adverse effect to human health and environment. Hospitals servicing 1000 patient and more per month are required to obtain authorisation from the respective State Pollution Control Board (SPCB)/Pollution Control Committee (PCC) of Union Territory. The State Pollution Control Board/Pollution Control Committee of Union Territory is the Prescribed Authority for implementation of Rules in their respective State and UT.

As per the information provided by the Central Pollution Control Board, the total quantity of bio-medical waste generated in our country is about 410 Metric Tons / Day and the total quantity of bio-medical waste treated is 295 Metric Tons /Day. Presently, only about 75 per cent of the bio-medical wastes generated in the country is collected, segregated and treated in accordance with the Bio-Medical Waste (Management and Handling) Rules, 1998 and the rest is apparently disposed of without any treatment along with the municipal solid waste. In addition to the 11,948 captive treatment and disposal facilities developed within some Health Care Facilities (HCFs), there are 177 Common Treatment and Disposal Facilities in operation in the country which were developed mostly by the private entrepreneurs. These common facilities cater to the needs of small hospitals, dispensaries and nursing homes, who are not in a position to set up their own treatment and disposal facilities because of high cost involved. There is still some gap between the BMW generated and treated which needs to be filled by creating adequate infrastructure in the country.

The major constraints in implementation of the Rules are lack of adequate equipments and infrastructure facilities for treatment and disposal of bio-medical wastes and lack of awareness and proper training to the medical and para-medical personnel in Health Care Establishments. Some other important issues in proper management of bio-medical waste are segregation of waste at source of generation, new technologies to be promoted to destroy toxic bio-medical waste, need to focus on small Health Care Facilities (HCFs) and HCFs in rural areas and minimization of bio-medical waste generation in Health Care Facilities. The other constraint is lack of adequate manpower in SPCBs/PCCs for compliance monitoring and taking actions against defaulters.

8.2.2 Performance during the 11th Plan

Following activities were undertaken by the Ministry to ensure proper handling and management of hazardous and biomedical wastes.

- Funding of treatment storage and disposal facilities (TSDFs) for hazardous waste and common biomedical waste treatment and facilities (CBMWTFs) for biomedical waste
- Notification of the Hazardous Waste (Management, Handling and Transboundary Movement) Rules 2008 and amendments
- Financial assistance provided for

- Conducting awareness-cum-training programmes on biomedical waste
- Preparation of hazard analysis and offsite emergency plans for 13 districts
- Development of national database on Major Accident Hazard (MAH) installations and chemical accidents

- The CPCB has developed a video film on bio-medical waste management in order to generate awareness about safety standards.
- The Ministry has sponsored a project on GIS based National Hazardous Waste Information System. It is an online web based system, which can give the status of hazardous waste management in the country. The database is required to be regularly updated by all SPCBs on web to ensure updated status at all times.
- In the World Bank funded scheme 'Capacity Building for Industrial Pollution Management' the Ministry has conducted pre-feasibility studies for rehabilitation of hazardous waste contaminated sites. As a follow up, rehabilitation work has been initiated at hazardous waste contaminated sites at Noor Mohammad Kunta (Andhra Pradesh) and Hooghly (West Bengal). The work is expected to be completed in the 12th Plan.

8.3 Other wastes

Other solid waste under the mandate of the Ministry include e-waste which is one the fastest growing waste stream and can be sources of health hazard if the recyclable components from it are not salvaged properly. The key initiative taken for e-waste management includes - Notification of E-waste (Management and Handling) Rules 2011 and providing authorization to 13 e-waste recycling units. Other 'soon to be' waste of concern includes end-of-life CFLs and tube lights which because if their residual mercury content should be dealt carefully.

8.4 Recommendations for the 12th Plan

General

- To address the problem of indifference in sectoral ministries of environmental issues (e.g. MoH&FW for biomedical waste and MoUD for MSW), environmental cell at the central and state level should be constituted in line ministries. MoEF should sensitize these cells and also monitor their functioning
- Dedicated budget head should be earmarked in line ministries to address the problems of sanitation and waste management

Municipal solid waste management

- Ministry of Urban Development (MoUD) should ensure creation of required waste management system in all urban local bodies. Municipal authorities should set up proper collection, storage, segregation, transportation, processing and disposal of municipal solid waste including plastic waste.
- Incentivizing PPP models for creating the required treatment/disposal infrastructure.

- Complete recycling of MSW should be ensured and energy generation from waste technology should be promoted to reduce the burden on landfills.
- Closure and rehabilitation of abandoned MSW disposal sites with recovery of landfill gas wherever feasible.
- There is also need to address problem of sanitation and solid waste management in the hilly areas and religious places on priority basis

Hazardous and biomedical wastes management

In order to encourage setting up of common treatment facilities for hazardous, electronic and bio-medical waste, this Ministry has a Central Sector Scheme (CSS) on Public Private Partnership (PPP) basis. Under the scheme, 25 percent of the total cost of the project is provided as the central government assistance subject to the availability of matching grant from the State government. In the case of NE States, 50 % of the total cost of the project is given as central government assistance. Project proposals for setting up of TSDFs/ CBMWTDFs/ Integrated E-Waste Recycling, Treatment and Disposal Facilities are required to be thoroughly examined by the SPCBs before forwarding them to the Ministry including from the angle of financial viability.

- Promoting utilization of hazardous waste as supplementary resource of energy or raw material by encouraging co-processing for recovery of energy, especially from wastes which have high calorific value and reprocessing/ recycling scrap or other wastes. Use of high calorific value hazardous wastes in cement kilns as a safe alternative to conventional incineration has been initiated. Use of such waste in power and steel plants also need to be explored
- MoEF has initiated a proposal for “Remediation on Hazardous Waste Dump Site” to undertake environmentally sound remediation of contaminated sites and to support the development and implementation of methodologies along with the institutional and legal framework under the National Clean Energy Fund. 12 contaminated areas were identified as priority sites in the country. The Ministry of Finance has approved financial support of 40% of the total project cost under NCEF. Further, an amount of Rs. 60 crore has been recommended for the preparation of DPRs in 2011-12. This project is required to be scaled up on mission mode basis in the 12th Five Year Plan to cover all such contaminated sites in the country.

Management of other wastes

- Expanding the e-waste recycling facilities and developing infrastructure for safe collection, transportation and recycling facility for spent CFLs and tube-lights.
- Channelizing e–waste from the informal sector to the formal sector to ensure recycling in an environmentally sound manner

Chapter 9: Environmental Impact Assessment (EIA)

EIA is one of the well-recognized management tools for incorporating environmental concerns in the development project at the planning stage. Environmental clearance has been made mandatory since January, 1994 in respect of 32 developmental activities including industry, Thermal Power, Mining, River Valley and Infrastructure projects and new constructions and industrial estate projects etc. Environmental clearance to developmental projects is accorded as per the procedure laid down in the Environmental Impact Assessment Notification. The Ministry has undertaken re-engineering of Environmental Clearance (EC) Process and issued an Environmental Impact Assessment Notification in 2006 and amendment in 2009. This notification replaces the earlier EIA Notification, 1994. Under this Notification, developmental activities have been categorized into Category 'A' and Category 'B' based on potential impacts instead of investment criteria. Category 'A' projects/activities will be appraised at the Central level by Expert Appraisal Committees while Category 'B' projects/activities will be appraised at the state level by the State Level Environmental Impact Assessment Authority.

To facilitate preparation of better quality of EIAs and for the benefit of all the stake holders, the Ministry has prepared sector specified manuals for the activities covered under the schedule of the EIA Notification, 2006 and has posted the same on Ministry's website. The sector specific manuals inter-alia include thermal power plants, refinery and petrochemical complexes, integrated steel plants, ports and harbours, mining and mineral sectors, coal washery, airports etc.

9.1 Coastal Regulation Zone clearance

For protecting the coastal environment, the Ministry had issued a Coastal Regulation Zone (CRZ) Notification in February, 1991 for regulation of development in coastal zone areas. Based on experience of the implementation of this Notification and on the basis of the Report titled 'Final Frontier' of Prof. M.S. Swaminathan, a re-engineered CRZ Notification was issued in January, 2011 for protection of livelihood of traditional communities, preservation of coastal ecology and sustainable development in coastal regions. The important feature of this Notification include procedure for CRZ approval with time lines, inclusion of water area upto 12 nautical mines in the sea, concept of hazard line to be demarcated over next five years and special provisions for areas like Greater Mumbai, Goa, Kerala etc. and designation of Critically Vulnerable Coastal Areas (CVCAs).

National Coastal Management Programme (NCMP)

NCMP is a new Central scheme launched in the 11th Five Year Plan. The scheme aims to support conservation of coastal environment through integrated coastal management and livelihood security of coastal communities. The NCMP project has been initiated with World

Bank assistance with an estimated cost of Rs. 1153 crores over a period of five years. The main components of this project are as following:

- Vulnerability and Ecologically Sensitive Area Mapping;
- National Institute Building and Capacity Strengthening; and
- Development and Implementation of State Level approaches to Integrated Coastal Zone Management in the States of Gujarat, West Bengal and Orissa.

9.2 Performance during the 11th Plan

The Ministry in consultation with the State Governments and Union Territories has so far constituted 25 state-level and one UT-level Environment Impact Assessment Authorities (SEIAAs) as per the requirements of EIA Notification of 2006. The SEIAAs would be responsible for appraisal of all 'B' category projects and activities as identified in the Notification.

Additional activities like building/housing complexes, breakwater and dredging have been included in the ambit of environmental clearance. For facilitating preparation of better quality EIA reports, ministry has sponsored a project for preparation of sector-specific manuals. Further, a scheme for accreditation/ registration of EIA consultant has also been initiated in collaboration with quality control of India with a view to improve the quality of EIA reports and to make environmental clearance process more efficient and effective. The various steps like status of pending project related information in public domain on ministry's website are taken to ensure transparency in environmental clearance process. The model Terms of Reference (ToR) has been prepared for preparation of EIA for coal mining projects and has been posted on Ministry's website for use by various stakeholders.

9.3 Recommendations for the 12th Plan

- Load based standards should be implemented to facilitate carrying capacity based and cumulative EIAs especially for areas having concentration of developmental activities such as mining, thermal power plants etc.
- Environmental database followed by real-time and time-series measurements by authenticated survey agencies such as CPCB, FSI and National Centre for Sustainable Coastal Management (NCSCM) for respective areas to fast track EIA process. The data on the EIS should be placed in GIS platform. The fund for undertaking this exercise should be earmarked.
- Mapping of areas covered under CRZ Notification need to be carried out in order to identify the vulnerable areas (e.g. mangroves)

Chapter 10: Pollution Abatement Strategies

10.1 Clean Technology

Clean technologies, as distinct from end-of-pipe abatement technologies minimize the generation of waste in the production process and utilize waste from consumption of goods or other production processes rather than treating the waste. Primary objective of the scheme is to facilitate and support development of clean techniques/technology aimed at specific end-use to protect the environment. Emphasis of the programme is on development and promotion of clean technologies for this purpose.

Status of the Scheme in 11th Five Year Plan

The Ministry has completed more than 20 projects in the areas of Carrying Capacity, Life Cycle Assessment and Demonstration Projects for development of indigenous technologies and capacity building for the environmental managers. At present, there are 15 ongoing demonstrations projects. Projects have been awarded by the Ministry on issues related to – air pollution control, treatment of groundwater contaminated with fluoride and arsenic, recycling of paint sludge generated in automotive industry, colour removal in paper and pulp industry wastewater, etc.

Since the inception of the scheme in 1994, various projects completed in this scheme include (i) Carrying Capacity Studies in various parts of the country namely Greater Kochi Region, Doon Valley, Damodar River Basin, Tapi Estuary and National Capital Region (NCR);, Natural Resource Accounting Studies for Upper Yamuna Basin; (ii) Life Cycle Assessment (LCA) Studies in Thermal Power Plants, Steel, Pulp and Paper and Cement (from cradle to facility gate). Second phase of the project i.e. cement (facility gate to grave) is continuing during the current financial year (iii) Demonstration project which has been completed are being implemented by the industries.

The new technologies developed under the scheme has been documented and forwarded to CPCB, SPCBs and other concerned agencies for implementation by the industries and sizable impact of pollution abatement and conservation of natural resources are realized.

The challenges in implementation of CT

The key challenges inhibiting the uptake of clean technologies by industries include:

- Development of indigenous and economically viable technologies for SMEs.
- Capacity building for the entrepreneurs to switch over to clean technology.
- The database for off-the-shelf option for clean and economically viable technologies.

Recommendations for the 12th Five Year Plan

- Development and promotion of indigenous techno-economically feasible cleaner technologies through demonstration projects to industrial prototype for SME sector

10.2 Waste Minimisation

The scheme on Industrial Pollution through Preventive Strategies lays emphasis on preventive aspects of pollution abatement and promotion of processes to reduce industrial pollution. The objective of the scheme includes:

- To assist the primary small units and some medium scale units who do not have requisite technical expertise to achieve waste minimization but exclude procurement of equipment and hardware
- Establishing and running Waste Minimization Circles (WMCs) in cluster of small and medium industries
- Capacity building in the area of Waste Minimization/Cleaner Production through training
- Waste minimization demonstration studies in selected industrial sectors
- Preparation of sector specific technical manuals on waste reduction, reuse and recycling
- Awareness programmes on preparation of compendium of success stories and cleaner production/waste minimization

Status of the scheme

At present there are 12 ongoing projects in various sectors on Waste Minimisation which are continuing till date. Some of the projects are related to pilot scale demonstration project while others are non-demonstration project including establishment of Waste Minimisation Circle (WMCs). The National Productivity Council has established 157 WMCs up to now. A number of training programmes has also been organized for the SMEs in various sectors of the country during the 11th Five Year Plan. To ensure successful off take, there is a need for enhancement of the pilot scale demonstration project for development of indigenous and economically viable technologies for SMEs. The number of WMCs establishments should also increase proportionately to the number of SME clusters.

Some of the important activities continued in the scheme during the 11th Five Year Plan include:

- Pilot scale demonstration projects for improvement and upgradation of existing as well as new technologies.
- Establishment of new WMCs across the country.
- Conducting training programmes, workshops and seminar for dissemination of information to SMEs to minimize and utilize the waste.
- Publications of newsletters and awareness material on waste minimization and utilization.
- Development of sector specific database on waste minimization.

Achievements of the scheme during 11th Five Year Plan:

1. Seven demonstration projects of Waste Minimisation have been completed
2. Implementation of Waste Minimisation Circles

The challenges involved/important issues

To achieve the goal of sustainable development through implementation of waste minimisation scheme the key issues are the following:

- To develop more indigenous and cheaper technologies through demonstration projects.
- Establishment of maximum number of WMCs.
- Effective awareness programme for SMEs about the techniques and strategies to be adopted for Waste Minimisation.
- Provide financial and technical incentives to SMEs to switch over clean technologies.
- Capacity Building in the SMEs on clean technology, awareness and adoption.

Recommendations for the 12th Five Year Plan

- As there is lot of synergy between the sub-schemes, Waste Minimization and Pollution Prevention Strategies and Clean Technology (ultimately concerned with reduction of waste), these sub-schemes could be merged. Enhancing the actual budgetary allocation of the scheme in 12th Five Year Plan
- Increasing the existing number of WMCs in the identified clusters

10.3 Critically Polluted Areas (CPA) Management

The Ministry of Environment & Forest (MoEF) has adopted a Comprehensive Environmental Pollution Index (CEPI) system of environmental assessment of the 88 prominent/major Industrial Clusters, evolved by the Central Pollution Control Board (CPCB) in collaboration with the Indian Institute of Technology (IIT), Delhi during 2009. CEPI, a rational number to characterize the environmental quality at a given location following the algorithm of Source, Pathway and Receptor and aggregated CEPI, indicates severe adverse effects on environment and also is an indication of larger percentage of population experiencing health hazards. On the 0 to 100 CEPI scale, 43 industrial clusters (CEPI scores > 70) out of 88 industrial clusters have been identified as critically polluted areas based on the parameters related to incidence of pollution in water, land (ground water) and air.

The Government had imposed a temporary moratorium on consideration of developmental projects in critically polluted industrial clusters/areas including the projects in pipeline for grant of environmental clearance under EIA Notification, 2006 and lifted the moratorium in phases, where Action Plans for restoration of environmental quality have been finalized by CPCB and initiation of their implementation has taken place.

The CPCB has done second round of environmental assessment of CPAs on the basis of monitoring carried out by Third Party during Feb March, 2011, which showed a mixed picture regarding CEPIs score. This highlights the need for proactive approach for management of CPAs.

Issues and challenges

- Because of inter-sectoral linkages review of effectiveness of the Action Plans in improving the quality of the environment in CPAs requires Area review at local level by District Magistrate or Senior Officer, State review by the Chief Secretary of the State or Senior Officer, Technical Review by Chairman, CPCB and National Review by Secretary (E&F)

Recommendations for the 12th Plan

- Siting of new industry in existing industrial area, pollution management in these areas based on polluters pay principle rather than shifting new industries to green areas
- Augmentation of Ambient Air Quality and Water Quality Monitoring Stations in CPAs, so as to have a time-series data on regular basis
- Load based standards should be developed for reducing the pollution in polluted areas especially CPAs for their holistic management
- Estimation of CEPI scores on periodical intervals.
- There is a need to carry out Health Impact Assessment through surveys and field data collection on time series epidemiological data and exposure levels for proper health risk assessment due to air water and ground water quality in the vicinity of CPAs.
- Round-the-clock source monitoring of emission/discharges need to be introduced in the larger industries in the cluster in a phased manner.
- There is a need for improved environmental surveillance as well as establishment of CETPs and TSDFs in CPAs.
- Industries located in CPAs should move towards Zero Wastes
- Three-tier monitoring system of the implementation of plans at the district, state and CPCB levels to be put in place

Chapter 11: Environmental Education and Awareness

Six schemes have been grouped under this head. These are Environment Education and Awareness (11th Plan); National Museum of Natural History (NMNH) (1978); Centres of Excellence (CoEs) [1983]; Environment Information System (ENVIS); information technology; and State of Environment Project (11th Plan). The major thrust of the schemes is enhancing people's understanding of the relationship between human beings and the environment and to develop capabilities/skills to improve and protect the environment. This is done through: (i) supporting institutions for the conservation of biodiversity, (ii) research and training in priority areas of environmental science and management, and (iii) providing information on environment and related subject areas to researchers, academicians, policy planners, environmentalists, scientists, engineers, and the general public through a decentralized network of ENVIS centres on diverse subject areas to strengthen awareness. The very context in which the original thinking of environmental awareness historically evolved has also changed. There has been recognition that creating awareness and sharing information about the environment will not achieve effective change. It is critical to move beyond awareness and knowledge to action. In order to do so, it is most important to also build skills and capacities and instill attitudes and values that encourage behavioral change.

ENVIS is a decentralized network of databases in operation with its Focal Point in the Ministry and provides information on environment and related subject areas to various stakeholders/users and the general public. ENVIS network consists of 76 Centres out of which 30 are State oriented Centres and 46 are subject specific Centres housed in institutions with expertise in specific subject areas as well as various State Governments/UTs. These ENVIS Centres serve as information collection, collation, storage, retrieval and dissemination. Centres on specific subjects and disseminates information to all user groups. These Centres have been set up in the areas of pollution control, toxic chemicals, central and offshore ecology, environmentally sound and appropriate technology, bio-degradation of wastes and environment management, etc. The ENVIS has been suitably strengthened so that a comprehensive web enabled information database is developed with the help of latest information technology.

The ENVIS Focal Point, developed a database, namely, Indian State Level Basic Environmental Information Database (ISBEID) with 17 modules and a GIS interface in association with National Informatics Centre (NIC), to assist the State Government ENVIS Centres to collect, collate and disseminate environmental information concerning their States in order to provide a back up support to the concerned State Governments to prepare their State of Environment (SoE) Reports. The ISBEID programme has been extended for all the States/UTs and with all the modules. ENVIS brought out one National State of Environment (SoE) Report in 2009. Several SoE reports for States/UTs were also brought out.

The UN Decade of Education for Sustainable Development (DESD), 2005-14 underlines this. The vision of DESD is a world where everyone has the opportunity to benefit from education

and learn the values, behaviour, and lifestyles required for a positive societal transformation and a sustainable future. One of the key thrusts of the Decade is to integrate understanding of sustainable development into education systems at all levels and reorient educational programmes, policies and practices so that education plays its part in building the capacities of all members of society to work together for a sustainable future.

The objectives of imparting environment education are being realized through implementation of the following programmes launched over the years:

- National Environment Awareness Campaign (NEAC)
- National Green Corps (NGC)
- Global Learning & Observations to Benefit the Environment (GLOBE)
- Strengthening Environment Education in School System and other courses at Graduate and Post-Graduate level including Professional Courses
- Advertising & Publicity
- Publication of Resource Material related to Environment
- Grants-in-Aid to Professional Societies & Institutions
- Seminars/Symposia/Workshops and other Awareness Programmes like Vacation Programmes, Quiz/Essay/Debate/Poster/Slogan competitions, training programmes, etc.
- Library

Performance during 11th Plan

- MoEF has initiated a process to have participatory feedback on the programme by involving various institutions/agencies in consultations and constituted working groups to look at specific areas of the programmes like output/outcomes and indicators, convergence, web portal and a National Steering Committee has been constituted to facilitate and guide the process.
- ENVIS network was re-oriented and strengthened to cover various environmental disciplines in order to develop a repository of information in the identified areas and to disseminate the information to all concerned. The system of network was expanded with 76 network partners or which 30 are state oriented network centres and 40 are subject specific centres.
- The Ministry's website was regularly updated and maintained by ENVIS and it recorded 1.5 lakh hits per month. The Ministry's website has been re-structured and redesigned.
- Continuous thrust on establishment of Regional Natural Museums of Natural History

Recommendations for the 12th Plan

- Focused attention on public awareness
- Periodic assessment of CoE, ENVIS and EEAT schemes for mid-term corrections if required

- Redesigning of ENVIS websites, by using content management system
- Putting all ENVIS Centre websites on NIC platform and linking them to ENVIS portal at head quarter to facilitate access to variety of information
- Convergence of programmes of MHRD on Environmental Education

Chapter 12: Environmental Economics

12.1 Economy - Environment Linkages

Economic management impacts on the environment and environmental quality has a bearing on the efficient working of the economy. Economic activities add stress to Ecosystems and introduce wastes into environmental media. Such activities also have inter-temporal effects. Natural resources are productive assets whose quality helps determine the productivity of the economy. Hence productivity of economy *inter alia* depends on supply and quality of natural and environmental resources. Further, environmental degradation imposes costs on the economy which results in output loss and human capital loss. The challenge of sustainable development thus requires integration of country's quest for economic development with its environmental concerns.

12.2 Need for Sustainable Development

Economic development without environmental considerations can cause serious environmental damage, in turn impairing the quality of life of present and future generations. Sustainable development necessitates a paradigm shift in public decision making and implementation attempting to strike a balance between demands of economic development and the need for protection of the environment. It aims at combining the elements of economic efficiency, social concerns and environmental protection.

Sustainable development concerns in the sense of enhancement of human well-being, broadly conceived, are a recurring theme in India's development philosophy. The National Environment Policy, 2006 provides common approach to various sectoral and cross-sectoral, including fiscal, approaches to environmental management. The NEP, 2006 aims at harmonizing the demands of development and environment concerns, thus mainstreaming environmental concerns in all development activities. The objectives of the Policy, *inter alia*, include integration of environmental concerns in economic and social development, efficiency in environmental resource use, Precautionary approach, Polluter pays principle etc. thus promoting the internalization of environmental costs. The Policy also emphasizes the use of economic principles in environmental decision-making.

In implementing its mandate, while the Ministry of Environment & Forests is guided by the principle of sustainable development and enhancement of human beings, attempting to accelerate development in an environmentally responsible manner, the current functioning of our system is marred by *functional silos* that lead to duplication/overlapping of activities, wastage of resources, etc. Environment involves cross cutting issues and hence it is necessary to bring synergy in various Departments for better implementation of the environmental problems. Various aspects of sustainable development, therefore, need to be incorporated to mainstream environmental concerns into economic/development policy.

12.3 Mainstreaming environmental concerns into Development Policy

Use of economic principles in environment decision making is increasingly being recognized. It calls for incorporating costs of degradation and depletion of natural resources into the decisions of economic actors at various levels, to reverse the tendency to treat these resources as "free goods" and to pass the costs of degradation to other sections of society, or to future generations of the country. Major environmental concerns requiring mainstreaming in development policy are discussed below:

12.3.1 Internalization of Environmental costs/benefits into Economic Policy

Sustainable Development involves ***valuing the environment*** thus placing proper values on the services provided by natural environments. The central problem is that many of these services are provided "free". They have zero-price simply because no market exists where their true values could be revealed through the act of buying and selling (e.g., biodiversity in a tropical forest). Zero/low price results in excessive exploitation of these natural resources resulting in environmental degradation. Greater use of market based instruments can facilitate better reflection of environmental costs thus internalizing environmental aspects in economic policy making. Efforts to integrate environmental values into appraisal of public investment projects need to be introduced, both at the level of understanding environmental effects and at the level of valuing those effects.

12.3.2 Adoption of social cost benefit analysis, incorporating environmental aspects for public investment projects

Investment projects have potential of causing pollution or depletion/degradation of resources. The outcome of projects in sectors like forestry, waste disposal, consists a mix of private/public and marketable/non marketable goods with costs/benefits spilling over region/generations. Some projects may not be viable from purely commercial considerations but may be if net social and environmental benefits are accounted. No doubt computation of shadow prices of environmental resources is complicated (public goods/private goods, user/non user charges etc), alternate second best solutions need to be discovered. Also, financial institutions need to be encouraged to adopt appropriate appraisal practices, so that environmental risks are adequately considered in the financing of projects.

12.3.3 Use of Economic Instruments

The NEP, 2006 recognizes policy failures can emerge from various sources, including the use of fiscal instruments such as explicit and implicit subsidies for use of various resources. Subsidies, like energy subsidies, encourage over consumption of natural resources and are environmentally damaging. Such perverse subsidies on resources should be withdrawn. As far as possible, natural resources prices should reflect their social costs; subsidies should be targeted only for the poor.

Similarly, scope for designing user charges for environmental services that signal users about their scarcity values and generate resources for their conservation and sustainable use need to be explored.

12.3.4 Natural Resource Management

Many environmental resources have become scarce and some have crossed threshold levels. In each location, causes for degradation of natural resources must be assessed; comparison of demand on natural resource with its carrying/assimilative capacity be made; and then plans be made for sustainable use of the resources. The deterioration in environmental resource hurts the poor more than the rich because of the dependence of poor people on the resource base for their livelihood and their inability to undertake the averting expenditures.

12.3.5 Natural Resource Management for sustaining livelihood concerns

Eco fragile areas need to be protected in order to sustain livelihood of large number of people. Natural resources play a vital role in providing livelihood and securing life support – ecological services. There is need to designing programmes to improve the quality & quantity of natural capital, providing income generating opportunities for the poor. User charges for environmental services to generate resources for their conservation and use.

12.3.6 Natural Resource Accounting

The idea of placing statistical coverage of environmental concerns in a national accounts framework also commands widespread support. Conventional accounts are likely to send wrong signals and may result in policy decisions which are non-sustainable for the country. Green accounting on the other hand is, focused on addressing such deficiencies in conventional accounts with respect to the environment. NRA provides an assessment of whether in the course of economic growth we are drawing down, or enhancing the natural resource base of production, including relevant depletable assets. Also, there is need to strengthen in all respects, the system of collection, collation and analysis of all significant and relevant environmental monitoring data.

12.3.7 Legal reform for pollution prevention and control

All our environmental legislations come under criminal laws. In implementation of the laws as well as in judicial decisions, the issue is on compliance or no compliance, and not on the extent of compliance. The penalties for non-compliance are unrelated to the compliance costs. On the other hand the economic compliance cost increases with the level of pollution prevention or abatement. This type of pollution control regime creates an opportunity for corruption and rent-seeking. The present standards and control regime – particularly the ones based on technology standards and input usage norms – provides no incentive for polluters to search for and adopt environmentally sound cost minimizing technologies/practices.

Present laws do not allow introduction of pollution charges or other market based instruments. Thus, amendments to the environmental laws may be needed to introduce pollution charges and other economic instruments, thus permitting use of a more judicious mix of the two regimes.

12.3.8 Integration of Eco-taxes with Goods and Services Tax GST

The Ministry of Environment and Forests has been advocating use of eco-taxes and eco-subsidies for effective management of the environment in the country. India is likely to introduce a major change in its system of indirect taxation by bringing in a comprehensive Goods & Services Tax, GST. It is felt that it is an appropriate time to introduce a GST that is well integrated with environmental tax reforms. The basic issues that need attention while integrating eco-taxes in the GST regime include:

- The overall GST logic calls for a single uniform rate for all goods and services, while eco taxes call for differentially higher rates for polluting inputs and outputs
- In GST, rebate on input taxes will make taxation of polluting inputs ineffective
- In destination based system, producing states do not collect tax to cope with environment damage, loss of minerals, damage to productivity of soil, but consuming states enjoy the revenues without suffering pollution.
- Incidence of pollution is regionally differentiated and states need to have autonomy to levy non-rebatable eco taxes on inputs and outputs.

Ministry's has brought out a Discussion Paper titled, 'Coping with Pollution: Eco-taxes in a GST Regime', which among other things mainly argues in favour of the following:

- Rationalization of pricing and subsidy of environmental sensitive products such as petroleum products, fertilizers, coal and electricity;
- Continuation/introduction of non-rebatable excise duties on petroleum products and electricity;
- Ceating space for introduction of non-rebatable excise duties, cess and user charges on other polluting goods/services and earmarking the revenue towards promotion of environment friendly technologies; and
- Undertaking required constitutional changes that enable the States to retain their autonomy in designing their environmental interventions.

There is thus a need to integrate **ecological taxes** as a component of the reforms of taxation of goods and services. Such reforms while facilitating green shift in taxation, need not result in an increase in the overall tax burden.

12.4 Initiatives, Sustainable Development Policies

Policy statement on Abatement of Pollution 1992 talks of economic instruments to encourage the shift from curative to preventive measures, internalizing the cost of pollution and conserving resources. The most widely used EI is the **Water Cess**. It is levied on the basis of quantity of water consumed by the industries and municipalities based upon the purpose for which water is consumed. The water rates, however, are abysmally low providing little incentive for its consumption. User charges/administrative charges in the shape of consent fee is being charged from polluting industries under Water and Air Acts. Other instruments used for environment management include reduction/waiver of tariff/duty and higher depreciation etc for pollution control equipment,

Another example of EIs is the charging of NPV for diversion of forest land for non forest purposes. Based on the estimated value of environmental services forgone by the local population by such diversion of forests, NPV has been estimated between Rs 0.58 - 0.92 million (USD 1318 to USD 20909) per hectare depending upon the nature of forest. The NPV gets collected in the **CAMPA** fund and is distributed to the states for taking up forestry works.

A recent initiative in environmental taxation include levying of a **cess on** production and import of **coal,** and setting up of National Clean Energy Fund from its proceeds to fund research and innovative projects in clean energy technologies. This is in pursuance of the objectives of combating global warming, as harnessing renewable energy sources and reducing dependence on fossil fuel is recognized as a credible strategy to combating global warming and climate change.

On development of **Green accounting**, Ministry has launched in February 2011 a major new project to value the immense wealth of natural resources and biodiversity in India. Collaborating with the Economics of Ecosystems and Biodiversity (TEEB) study, the Ministry has begun the process of valuating its natural capital and ecosystem services in terms of economic value. The India TEEB project aims to recognize and harness the economic valuation of biodiversity and ecosystem services. It targets action at the policy level, the business decision level and the awareness of citizen. It will facilitate mainstreaming natural resource accounts with conventional income accounts. Another initiative relates to undertaking a programme by the Planning Commission to develop natural resource accounting and green GDP estimates by 2015. This follows recent initiative by the World Bank to move forward with a group of first mover nations willing to measure and report their natural capital as part of their national accounts.

As an experiment in innovative governance and a step away from command and control architecture, a pilot project on **emission trading** in three states of Tamil Nadu, Maharashtra and Gujarat has been launched to enable cap and trade of local pollutants in these states. Use of such market based instrument would facilitate enforcement of laws without rent seeking.

To promote sustainable production and consumption patterns, and with a view to leverage government procurement budget towards encouraging green supply chains, an initiative has been launched to develop **green public procurement** guidelines. Ministry has taken up a pilot project in collaboration with CII-Centre for Sustainable Development to develop policy guidelines and benign green products criteria/specifications which could be purchased through public procurement.

It is important to note that the terms of reference of the **Thirteenth Finance Commission** (TFC**)** included explicit mention of the need for internalization of the environmental considerations in public decision making; and also specifically stated sustainable development as an overarching principle. The Commission has taken a sensitive perspective on the environment and forests sector and has made several significant recommendations on the same.

While allocating grants for environment and forests sector, the TFC has identified three kinds of environmental risks. *Growth-related risks* resulting from uncontrolled release of industrial pollutants into the air and into water bodies exacerbate poverty-related risks resulting from inadequate access to potable water, absence of adequate sanitation and indoor air pollution. Increase in the forest cover and protection of forest would be the first line of defence against pollution. Hence, the Commission has allocated Rs. 5000 crore as forest grant for the period 2010-2015, which is a five time increase from previous Finance Commissions recommendation.

The second kind of environmental risk highlighted by the Commission relates to *Policy-induced environmental risks (State*). The widespread practice in states of zero-pricing electricity for farmers has resulted in an alarming fall in ground water levels in many zones in the country, accompanied by soil salinity due to the conjunction of over-application of under priced groundwater and poor drainage. In many states, surface irrigation water has a crop-specific rate structure, which is not crop-neutral and frequently carries an adverse incentive in terms of encouraging cultivation of water-intensive crops, even in regions that are water scarce. The TFC has recommended incentives to the states which reform electricity policy and Aggregate Transmission and Commercial (AT&C) losses. It has recommended a forward looking incentive scheme, with an allocation of Rs 5000 crore, for generation of grid-connected electricity from renewable sources. Also, keeping in view the critical situation of both surface and ground water in India, the Commission has recommended setting up of a Water Regulatory Authority in each state and specification of a minimum level of recovery of water charges. An incentive grant of Rs. 5000 crore is recommended by the Commission for such water sector management.

The third type of environmental risks highlighted by the Commission in its Report relate to *Policy-induced environmental risks (Centre).* Some of Government of India (GoI) policies also have added to the environmental risks facing the country. Perhaps the most egregious example is the national fertiliser subsidy scheme. Uneven price interventions across nutrients have led to a decline in soil quality due to application of a distorted nutrient mix. TFC has recommended phasing down the fertilizer subsidy to a level in 2014-15, which is approximately one-fifth of that budgeted level for 2009-10.

To address the special problems pertaining to the states, the Commission has emphasized on environmental issues and has allotted Rs 2063 crore to 10 states to protect or restore their environment.

To promote **energy efficiency** in energy intensive industries, an Energy Efficiency Mission has been launched under the National Action Plan on Climate Change. The Mission aiming at Perform, Achieve, Trade under energy has put in place a major market based programme to stimulate energy efficiency. The Union Budget 2011-12 has also announced launching of a National Mission for hybrid and electric vehicles, in collaboration with all stakeholders, to provide green and clean transportation for masses.

Government has also set up two committees to address the need for greater transparency and accountability in procurement policy and allocation, pricing and utilization of natural resources, as announced in the Union Budget 2011-12. The Government intends to pursue a path of low carbon 'green economy' through its policies of concisions analysis of the tradeoffs between economic growth and environment based on sustainability assessment.

12.5 Recommendations for the 12th Plan

- **As stated earlier, load based standards would be required to design various EIs and implement them.**
- **Reversing the tendency to treat environmental resources as free goods**
    - Develop/strengthen Natural/Green Resource Accounting, with a view to its adoption in the system of National Income Accounts.
    - Also, strengthen in all respects, the system of collection, collation and analysis of all significant and relevant environmental monitoring data.
    - Removing subsidies that encourage unsustainable use and appropriate pricing of environmental goods and services
- **Incorporating costs of degradation/depletion of resources at various levels**
    - Facilitate the integration of environmental values into cost-benefit analysis, to encourage more efficient allocation of resources while making public investment decisions.
    - Encourage financial institutions to adopt appropriate appraisal practices, so that environmental risks are adequately considered in the financing of projects.
    - Develop and promote the use of standardized environmental accounting practices and norms in preparation of statutory financial statements for large industrial enterprises, to encourage greater environmental responsibility in investment-decision making, management practices and public scrutiny.
- **Greater use of Economic Instruments/principles**
    - Prepare and implement an action plan on the use of economic instruments for environmental regulation in specified contexts, including those relating to unsustainable production and consumption.
    - Consider creation of a National Environment Restoration Fund from the net proceeds of economic instruments, user fees for access to specified natural resources, and voluntary contributions. The Fund may be used for restoration of environmental resources, including clean-up of toxic and hazardous waste legacies.
    - Amendments to the environmental laws to introduce pollution charges and other economic instruments
- **The design of the new GST system needs to take on board the environmental considerations with a view to imparting a green shift to India's tax system.**

- **Incentivizing good environmental performance by larger environmental promoting subsidies (like from Finance Commission) and grants (from Planning Commission.**

Chapter 13: International Cooperation

MoEF is the nodal Ministry in the Government of India for all Bilateral and Multilateral Environmental Agreements. These include Vienna Convention for the Protection of the Ozone Layer, Montreal Protocol on Substances that deplete the Ozone Layer, Conventions on Biological Diversity, UN Framework Convention on Climate Change, UN Convention to Combat Desertification, Kyoto Protocol, the Basel Convention on Trans-boundary Movement of Hazardous Substances, Stockholm Convention on Persistent Organic Pollutants, Rotterdam Convention, Ramsar Convention etc.

International Co-operation & Sustainable Development Division is the nodal point within the Ministry to coordinate all international environmental cooperation and sustainable development issues. It is the nodal Division for United Nations Environment Programme (UNEP), UN Commission for Sustainable Development (CSD), United Nations Development Programme (UNDP), the World Bank, UNIDO, Global Environment Facility (GEF) and regional bodies like Economic & Social Commission for Asia & Pacific (ESCAP), South Asian Association for Regional Cooperation (SAARC), South Asia Cooperative Environment Programme (SACEP), ADB and European Union (EU), India Brazil South Africa (IBSA) Summit on Environment, etc. The Division also handles bilateral country to country co-operation in the areas of environment protection and sustainable development. This Division also deputes officers for participation in conventional meetings organized by UNEP, UNDESA, GEF and other UN Agencies and international organizations.

The NEP 2006 also stressed on the need for bilateral/multilateral cooperation for the country to enable the country to address the following:

- Meet commitments under the multilateral instruments
- Access international resources for sustainable development and
- Assist other developing countries for scientific and technical capacity building for environmental management.

13.1 Progress during the 11th Plan

The expenditure under the scheme has mostly been on travel since India has been participating in international negotiations. The CCU component has now been transferred to non-plan.

- Submission of National Report “Towards Sustainable Growth: Transport/Chemicals/ Waste Management/Mining/SCP” to the Commission in its 18th Session during 2010.

13.2 Conventions/Protocols

The international conventions under this sub-group which are handled by the Ministry include:

- The Rotterdam Convention on the Prior Informed Consent (PIC) Procedure for certain hazardous chemicals and pesticides in the international trade. The objective of this Convention is to promote, share responsibility and cooperative efforts among parties to protect environmental health and environment due to trade in chemicals, facilitate information exchange on chemicals and to trigger a national decision process on import and export of highly toxic chemicals. The Convention came into force in February 2004 and India became party to the Convention in January 2006. The 5th meeting of the CoP of the Rotterdam Convention was held on 20-24 June, 2011 at Geneva. After detailed deliberations, the CoP-5 approved the inclusion of Alachlor, Aldicarb and Endosulfan in the Annex III of the Convention. India was re-elected to continue its membership in the Chemical Review Committee (CRC) of the Rotterdam Convention.
- The Stockholm Convention on Persistent Organic Pollutants (PoPs). The Convention seeks an initial twelve chemicals for restriction or elimination of the production and releases which include organochlorine pesticides, persistent industrial chemicals and unintentionally produced toxic chemicals. India submitted its instrument of ratification for the Convention in January 2006 and it came into force for India in April 2006. India has developed the National Implementation Plan (NIP) and transmitted to the Stockholm Secretariat in April, 2011. GEF has sanctioned a Post-NIP project on "Environmentally Sound Management and Disposal of PCBs." The National Steering Committee under the Chairmanship of Secretary (E&F) has entrusted the work related to implementation of the project activities to Central Power Research Institute, Bangalore. Under the project, it is proposed to establish one static facility at Bhillai Steel plant, Bhillai and two mobile facilities for disposal of PCBs.
- The Basel Convention and Control of Transboundary Movement of Hazardous Wastes. The main obligation under the Convention is to control transboundary movement of the hazardous waste. India has signed the Basel Convention in May 1989 and is Party to Convention since 1992.
- Strategic Approach to International Chemical Management (SAICM). SAICM is an international cooperation to protect human health and environment. SAICM convened the 2nd International Conference on Chemicals Management (ICCM-2) during 11 to 15 May 2009 in Geneva which was the first substantive meeting of the ICCM, providing an opportunity to take stock of early phases of SAICM's implementation and focus on management issues to make the ICCM operational in the long-term so that by the year 2020, chemicals are used and produced in a way that protects human health and the environment throughout their life cycle. The 2020 goal would be met by assessing early

reports on implementation, the work of the Quick Start Programme (QSP) and to look forward to the institutional arrangements, such as inter-sessional processes including for emerging issues, reporting and long-term financing. The decision of the ICCM-2 was to address, inter alia, the following new emerging issues:

- lead in paint,
- nanotechnology and nanomaterials,
- Use of chemicals in electrical and electronic products

A project titled "Inventorization of Lead, Cadmium, Mercury and Arsenic in Paints, Distempers and Pigments" has been initiated involving National Metallurgical Laboratory (NML), Chennai to make an inventory of lead, cadmium, mercury and arsenic present in paint, distemper and pigment samples, manufactured by companies in the organized and unorganized sectors in India.

- India became a signatory to the United Nations Convention to Combat Desertification (UNCCD), one of the three Rio conventions, on 14th October 1994 and ratified it on 17th December 1996. As a party to the Convention, India has been meeting its obligations through implementation of various programmes and projects across the country; participating in the meetings of the subsidiary bodies and the Conference of Parties (COP); and reporting on the progress to the UNCCD secretariat periodically. India has already submitted four National Reports in the years – 2000, 2002, 2006 and 2010. The fourth National report was submitted online through Performance Review and Assessment of Implementation System (PRAIS) portal. The Elucidation of the 4th National report is also available at http://moef.nic.in/modules/divisions/desertification-cell/unccd-report.pdf. The fourth report incorporated reporting on performance indicators; whereas the fifth national report due in 2012 will incorporate reporting on performance and impact indicators, in accordance with the UNCCD's Ten year Strategy (2008-18). For reporting on impact indicators, a Brainstorming Workshop on 'Desertification Mapping and Reporting on Impact Indicators' was organized on 27 July 2011 with the objective of harmonisation of data using existing assessment tools for reporting on the impact indicators.

13.3 Bilateral Agreements

MoEF has entered into bilateral cooperation agreements with around 25 countries including U.K., France, Germany, Denmark, Sweden, Norway, E.U. etc. Most of these agreements are operated through the mechanism of Joint Working Groups. These agreements provide mechanism for international interactions and consultations in the field of environment including the issues related to climate change.

13.4 Recommendations for the 12th Five Year plan

- Engage with International Convention Authorities to set up regional secretariat in India
- Continue close engagement with bilateral agencies and GEF