15.2. ENVIRONMENT AND CLIMATE CHANGE

Introduction

The natural environment with its numerous living and non-living resources is man's most precious heritage. The basic goal of environmental conservation is the management of human use of these natural resources, so that they may yield the greatest sustainable benefits to the present generation while maintaining their potential to meet the needs and aspirations of future generations.

Like other nations, India too bears the scars of damage done to its natural environment resulting in a wide array of environmental problems affecting the well-being of its citizens. While in the developed countries, environmental problems are largely the by-products of affluence marked by resource wasteful life-styles. The stress on India's environmental resources comes mainly from the pressures for satisfying the basic human needs of a large and growing population.

Environment protection is the key to ensure a healthy life for the people. Environmental problems are on the increase and are more prominent in densely populated cities. Exploding urban migration, as experienced in the last decade, is bound to widen the gap between demand and supply of infrastructural services such as energy, housing, transport, communication, water supply, sewerage and solid wastes disposal and recreation for communities. The release of high level of sulphur dioxide, carbon monoxide, oxides of nitrogen and suspended particulate matter by industries and vehicles to atmosphere is adding to air pollution.

The area around Manali near Chennai, the belt of Vaniyambadi to Ranipet in Vellore District, textile and dyeing industries in and around Tiruppur and Erode towns, Cuddalore SIPCOT and areas around tanneries in Vellore district are most prone to industrial pollution in Tamil Nadu.

The Departments/Board dealt in this chapter are Tamil Nadu Pollution Control Board and Department of Environment.

Tamil Nadu Pollution Control Board (TNPCB)

The TNPCB is concerned with various environmental legislations. Some legislation is implemented directly by the Board and some by other departments of the Government.

Performance in Eleventh Five Year Plan

Water Pollution Control

The Board collects samples of sewage and trade effluents from the industries, analyzes and issues 'Consent to Establish' orders and 'Consent to Operate' orders under the Water (Prevention and Control of Pollution) Act, 1974 as amended during the year 2010-2011. The Board collects Cess from the specified industries and local bodies and remits to the Ministry of Environment and Forest, Government of India, New Delhi, every month.

Air Pollution Control

Ambient Air Quality Monitoring Programme at Chennai City

The ambient air quality data collected from the air quality monitoring stations, National Ambient Air Quality Monitoring Programme (NAMP) indicate that all the parameters such as sulphur dioxide, oxides of nitrogen, total suspended particulate matter and respirable dust particulates are found to be well controlled in the industrial areas due to effective monitoring of industrial source emissions by the TNPCB.

Fig 15.2.1 Ambient Air Quality Monitoring

Vehicular Emission Monitoring in Chennai City

"Emission under control" certificates are issued to only those vehicles that comply with the emission standards in the tests conducted.

Noise Pollution Control

Environmental Awareness and Public Participation

Special monitoring programmes were launched by TNPCB during festival seasons with monitoring of noise level and air quality level during Deepavali and monitoring of air quality level during Bhogi. The Noise level and the Ambient air quality surveys were conducted during Deepavali in important cities of Tamil Nadu. A special Ambient air quality survey on pre-bhogi, bhogi and post bhogi days were conducted in Chennai at nine places. Nearly 160 awareness programmes were conducted on various environmental issues for the public, school students, other institutions etc.

Hazardous Waste Management

Out of 53 CETPs (Common Effluent Treatment Plant) formulated, 15 CETP schemes for tanneries, 29 CETP schemes for textile dyeing units and 1 CETP scheme for hotels and lodges are under operation. 6 CETP schemes for tanneries and 2 CETP schemes for textile dyeing units are under various stages of implementation.

Bio-Medical Wastes Management

Eleven Common Bio-medical Waste Treatment and disposal facilities (CBMWTF) have been established for the private sector health care units in the State.

Monitoring of Indian National Aquatic Resources (MINARS) and Global Environmental Monitoring System (GEMS)

Under GEMS and MINARS programme, the river Cauvery is being monitored. Under MINARS programme, the rivers Thamiraparani, Palar and Vaigai and lakes such as Udhagamandalam Lake, Kodaikanal Lake and Yercaud Lake are being monitored.

Monitoring of Chennai City Waterways

Chennai City is traversed by four waterways namely the Cooum, Adyar, Buckingham Canal and Otteri Nullah. The TNPCB is monitoring these water ways to assess the level of pollution by collecting water samples every month both at water bodies and industrial outlets.

Other Activities of the Board

Green Cover Programme

As a measure of pollution check, industries have been directed to develop 25 percent of the land area as green belt with trees in and around the industrial premises.

Water Conservation

The three major industries in Manali and Basin Bridge area are utilizing about 25 MLD (million liters per day) of city sewage in their plants after tertiary treatment for cooling purposes. 207 dyeing units in the State including 148 units at Tiruppur have provided reverse osmosis plants to recover the process water from the effluent. In sugar industries, water condensate from evaporators is reused.

During the last two years, all the industries have set up rainwater harvesting systems including the offices of the TNPCB.

Cleaner Technologies

Tamil Nadu has switched over to cleaner technologies such as adoption of dry process instead of wet process to reduce air pollution in cement factories, adoption of double conversion and double absorption technology in sulphuric acid manufacturing, gas carburizing instead of cyanide salt in heat treatment and cyanide free electroplating. Pulp and paper industries are encouraged to go in for elemental chlorine free bleaching, industries changing to environment friendly compounds. Tanneries adopt desalting, reuse of lime and chrome recovery system so as to reduce the pollution load in the effluent.

Waste Minimisation

Out of 17 distilleries, 16 distilleries have gone for bio composting of their effluent with press mud of sugar factories for achieving zero discharge of trade effluent.

Energy Conservation

All the distilleries are recovering methane gas from their spent wash through anaerobic digestion. Major sugar factories have installed co-generation power plants. The sago units recover methane gas from their trade effluent through anaerobic digestion. In activated carbon process, the waste heat is recovered and used at boiler section.

Green Bench

The Hon'ble High Court of Madras has constituted a Green Bench, which deals with cases pertaining to environment related matters. The TNPCB has designated powers to the Chairman to grant consent to all "Green Site" applications received from new industries pertaining to red category.

Environmental Training Institute

The main objective of the Training institute is to impart training to staff of the TNPCB, industrial representatives, Executives of Municipalities and Corporation, line agencies and Non-Governmental organizations.

The Tamil Nadu Pollution Control Board has utilized its own funds during the Eleventh Five Year Plan period.

Department of Environment

The Department of Environment is the Nodal Department for dealing with environmental management of the State and implements the following major works:

Fig. 15.2.2: Science Exhibition conducted under ENVIS

- Implementation of National River Conservation Plan (NRCP) for the abatement of pollution in Cauvery, Vaigai, Tamiraparani rivers and Chennai City waterways through Environment Management Agency of Tamil Nadu (EMAT
- Implementation of National Lake Conservation Plan (NLCP) for the abatement of pollution in the selected lakes.
- Carrying out various Environmental awareness programmes for school students, through National Green Corps .
- Enforcement of the provisions of the Coastal Regulation Zone (CRZ) Notification.

- Implementation of Emergency Tsunami Reconstruction Project (ETRP) with World Bank assistance.
- Provision of web-based environmental information through Environmental Information System (ENVIS) on State of Environment and related issues of Tamil Nadu.

Performance in Eleventh Five Year Plan

Abatement of Pollution in the Rivers of Tamil Nadu

By implementing this scheme, 249.55 MLD of sewage is being effectively treated in nine towns.

Chennai City River Conservation Project (CCRCP)

A quantity of 264 MLD of sewage is treated by Chennai Metropolitan Water Supply and Sewerage Board under this programme.

National Lake Conservation Plan (NLCP)

The Revival of Kodaikanal lake has been sanctioned for ₹10.43 crore and the works are under progress.

Fig. 15.2.3 : Water testing at Kodai Lake

Schemes Implemented with Government of India Assistance

National Green Corps (NGC)

Nearly three lakh children are participating in this awareness movement. Eco-clubs were started at the rate of 100 schools per district. The scheme was extended further to 200 schools additionally in each district. Under this scheme, ₹2500 per year is given to each school for carrying out environmental awareness programmes. This scheme will be continued in the Twelfth Five Year Plan also.

World Bank Assisted Emergency Tsunami Reconstruction Projects

The details of works that are taken up under ETRP by World Bank funding are listed below.

- Demarcation of High Tide Line (HTL).
- Erection of Stone pillars on the HTL reference points for entire coast of Tamil Nadu.
- Erection of stone pillar to mark the high tide line
- Preparation of Integrated Coastal Zone Management Plan, Preparation of Vulnerability Map and Preparation of Training Module for Tamil Nadu.

Fig.15.2.4: Stone laying to mark high tide line.

Table 15.2.1: Allocation and Expenditure during the Eleventh Plan Department of Environment

(₹ crore)

S.No.	Name of the Component	Amount allocated	Amount sanctioned	Expenditure incurred
1	Environment awareness creation	9.25	1.18	1.18
2	New Schemes for Environment Protection and Awareness	2.00	2.99	2.99
3	World Bank Assisted Emergency Tsunami Reconstruction Project (ETRP)	29.44	9.70	4.02
4	Restoration of Palkeni lake in Pallavaram	0.10	0.10	0.10
	Total	**40.79**	**13.97**	**8.29**

Twelfth Five-Year Plan

Objectives

The Guiding Principles during the Twelfth Five Year Plan period for the sector "Environment and Climate Change" would be as follows:

Box 15.2.1: Guiding Principles

- Equity and gender sensitivity
- Green Lens
- Co-ordination of Departments
- Facilitating agencies
- Capacity building and technology inputs
- Monitoring, evaluation and learning

While Tamil Nadu focuses on industrial development at a pace faster than the National average, the Vision Tamil Nadu 2023 Document stresses that it will not lose sight of the need to preserve the environment and its heritage. Efforts will be made to ensure that the environmental protection regulations are on par with the best in the world and deliberate focused efforts will be made to ensure that the environment is protected.

Thrust Areas – Key Issues and Major Interventions

- Air Quality – local pollution hot spots and status of current actions.
- Water Quality – domestic and industrial pollution flow into water bodies and status of various interventions.
- Pollution abatement in rivers, lakes and water bodies.
- Waste Management – municipal solid waste and status of adherence to MSW2000 (Municipal Solid Waste) rules; bio-medical waste; plastic waste; hazardous waste; electronic waste.
- Noise pollution
- Capacity Building.

The Environment and Forest department's draft Tamil Nadu State Environment policy 2012 envisaged to focus on environmental sustainability and realize the objectives of Vision Tamil Nadu 2023, looking at strategies to revamp and restructure the Tamil Nadu Pollution Control Board, the Directorate of Environment and related institutions to make them participative and transparent in decision making. The draft State Environment policy focuses on emerging interventions like market- based instruments in management of environment

and natural resources. These new and emerging interventions include eco tax, green economy and green growth besides public-private partnership in the environment sector and development of statistical systems that estimate environmentally adjusted growth. It also focuses on promoting and regulating activities towards providing a healthier environment in the State through better air, water, soil quality management. The State Environment Policy's thrust areas include focusing on air quality by identifying local pollution hot spots and charting out action plans, on water quality by monitoring domestic and industrial pollution flow into water bodies and focusing on various intervention measures. The policy will also focus on pollution abatement in rivers, lakes and water bodies besides waste management and coastal zone management.

Strategies for Climate Change

Lower Carbon Mitigation Strategy for Inclusive Growth

A clear strategy for achieving the domestic mitigation goal has to be formulated during the Twelfth Plan, with a view to enable the industry to grow sustainably while protecting the environment. This requires that the potential of relevant sectors is studied through a well-planned exercise to reduce emissions relative to output and the cost of implementing such policy measures and actions is assessed and provided for in course of the Twelfth Plan. A set of nationally appropriate mitigation actions in various sectors will have to be identified and implemented through a nationally coordinated policy to fulfill this objective.

A National mechanism for identifying and financing such actions will be needed. Besides, a National system for GHG (Green House Gases) emissions monitoring and management will also have to be put in place. The existing system for preparing and reporting the National GHG inventory will need to be enhanced and suitably equipped in order to meet the international obligations to submit National Communications (NATCOMs) at periodical intervals. This will also include a process of periodical (biennial) update of inventories and evaluation and assessment of the impact of the mitigation actions on the National goal.

Integrating the NAPCC in the Sectoral Plans

The National Action Plan advocates a strategy of promoting adaptation to Climate Change thereby enhancing ecological sustainability of India's development pathway. India's National Action Plan stresses that maintaining a high growth rate is essential for increasing the living standards of the vast majority of people of India and reducing their vulnerability to the impacts of climate change. Accordingly, the Action Plan identifies measures that promote the objectives of sustainable development of India while also yielding the benefits of addressing climate change. The focus is on promoting understanding of climate change, adaptation and mitigation, energy efficiency and natural resource conservation.

Implementing Climate Change Related Actions at State Level

The State Government is currently preparing State level Action Plans for climate change (SAPCC) and adequate provisions will have to be made in the Twelfth Plan either through the developmental plans of the concerned State Governments or the nodal Ministries to support the SAPCC.

Box 15.2.2: State Action Plan for Climate Change (SAPCC)

Department of Environment, GOTN has been designated as the nodal department for the development of SAPCC.

- SAPCC shall be integrated into the State level planning process so that the resource allocation for the implementation of the identified adaptation / mitigation measures can be defined with an objective to achieve the development goals of the State governments.
- Identification of effective adaptation strategies for addressing adverse effects of climate change on vulnerable regions and population, and synchronization of such strategies with the developmental activities to "mainstream" the adaptation to climate change.
- Incentive schemes for reducing energy intensity and for promoting energy conservation and promotion of renewable resources.
- Developing authentic and quality database on all relevant aspects of climate change to facilitate informed policy making based on sound analysis.

Source: TN Working group report on Environment and Climate Change

Strengthening Scientific Research Capacity and Strategic Knowledge for Climate Change Observation and Assessment

Strengthening the capacity to assess vulnerability and impacts of climate change and conduct scientific studies of the ecological changes in different sectors such as agriculture, coastal areas, water etc. are critical to support the climate change related policy interventions. The Plan will have to be geared to put in place scientific observation systems and launch specific programmes to build up and enhance such capacity.

Cross-Cutting Areas – Key Issues and Major Interventions

- Climate Change.
- Environment and Health .
- Policy Framework – New and Emerging Interventions.
- Green Economy and Green Growth.
- Integrated Coastal Zone Management.

Climate Change

Climate change has emerged, in recent times, as an important area of both international as well as domestic policy making and development planning. The recent Assessment Report (AR4) of the Inter governmental Panel on Climate Change (IPCC) has shown that climate change would have significant impact on myriad economic sectors and ecosystems. Climate variability and change can slow down the pace of development either through adverse impacts on natural ecosystems or erosion of the adaptive capacity of people and society. Climate change is, therefore, not only a major global environmental problem, but an issue of great concern to a developing country like India.

Environment and Health

- Indoor and outdoor air pollution linkages to health burden, especially among women children and elderly in rural, urban and semi-urban areas.
- Water pollution linkages to health burden through indiscriminate use of chemical fertilizers and pesticides leading to non point source water pollution.

Policy Frame Work- New and Emerging Interventions

- Environmental Tax Return - facilitates gradual shift towards management of

environment and natural resources using market based instruments (e.g. eco taxes).

- Public Private Partnership in environmental sector.

Green Economy and Green Growth

Facilitating move towards green economy and inclusive growth and development of statistical systems that estimate environmentally adjusted growth.

Integrated Coastal Zone Management Plan (ICZMP)

The Plan assess the impact of coastal regulation zone of various economic activities and progress on integrated coastal zone management.

Programmes Proposed by TNPCB

Air Quality and Air Pollution

In order to meet the requirement of monitoring capabilities due to the revised standards of GOI, the Board has proposed to upgrade all its 13 Air Monitoring Laboratories in the Plan period. The financial outlay proposed under this programme is ₹10.00 crore.

Water Quality and Water Pollution

The development of facilities to divert the treated sewage for use in irrigation to prevent nutrient pollution of water bodies, utilize the nutrient value of sewage in irrigation and bring down fresh water use in irrigation and in urban tree planting programmes.

Surface Water Quality of Buckingham Canal and Cooum River

Under the National River Conservation Plan (NRCP), implementation of pollution abatement works has been carried out in the rivers of Adyar, Cooum, Cauvery, Pennar, and Vaigai.

Activities Proposed by TNPCB during the Twelfth Five Year Plan.

- Eco-restoration of water bodies (Five selected water bodies will be identified for the project).
- Rural waste management
- Public participation in waste utilization
- Nutrient management in water bodies.
- Treatment and reuse of STP sludge.
- Improving the hygienic quality of drinking water in rural areas.
- Integrated Environmental Management Plan for selected Town (Model town concept)
- Management of non-point domestic wastewater discharges on river banks.
- Solar powered desalination plants for brackish water areas.

A State level Super Referral Quality Control Laboratory funded by TNPCB will be set up during the plan period.

Programmes/schemes proposed by Department of Environment:

Framing of the State Environment Policy for Tamil Nadu with consultations of all Stakeholders shall be initiated during the plan period.

Fig.15.2.5: Air Pollution

Box 15.2.3: Environment Protection and Renewable Energy Development Fund

The Government of Tamil Nadu have created an "Environment Protection and Renewable Energy Development Fund" for implementing Schemes for the protection of the environment and promotion of clean energy in the State. This fund will be utilized both for (a) promotional and (b) project based activities and will cover activities of greening of Tamil Nadu through planting of trees outside the forest areas, the initiatives and interventions in the field of renewable energy and prevention of environmental degradation. This fund is available for Government Departments, Public Sector Undertakings /Organizations, Non-governmental Organizations, Voluntary Organizations, Self-Help Groups, Tree Grower Societies, Community Based Organizations, Educational and Research Institutions / organizations and individuals with the main aim to promote mitigative and adaptive measures to combat effects of climate change in the State.

Source: Policy note 2011-12, Dept. of Environment, GoTN

Environmental awareness creation through school children

Assistance to the eco-clubs will be increased from ₹2500 to ₹5000 per year to undertake various awareness activities. It is also proposed to expand this network throughout the State during this Plan period with an outlay of ₹10.00 crore. This programme is extended to all the schools and colleges owned by Government of Tamil Nadu. The District Eco Club coordinators nominated by this department will assist the Teacher coordinators.

In order to create awareness among public especially students, National Green Corps (NGC)/Eco-clubs in educational institutions have been formed in all the 32 districts. It is proposed to extend the awareness network to all the schools in Tamil Nadu. The outlay for the plan period is ₹1.50 crore.

Fig. 15.2.6: Eco-friendly demonstration activities.

Promoting Environmental Research

Environmental research is important to understand the multi-disciplinary aspects of environmental problems together with the creation of facilities and development of technical capabilities in the academic institutions. The financial outlay for the plan period is ₹2.50 crore.

Environmental Management

Preparation of Environmental Management Plans for Corporations Class I & II, Municipalities

During the Plan period, Environmental Management Plans (EMPs) for holistic control of all pollution, like vehicular traffic,

urbanization, growth of population, pollution of water bodies, infrastructure development, change in land use pattern etc., will be undertaken for environmental hot spots in the State. The financial outlay- for the plan period is ₹2.00 crore.

Updating District Environment Profiles for all Districts in Tamil Nadu / State of Environment Report / Environmental Status Report Studies

It is proposed to take up District Environment profiles stating the current environmental scenario of each district with a total outlay of ₹6.00 crore.

Revival / Bio-remediation of Ooty lake

Ooty lake is spread over 20 ha with the depth ranging from 1m to 8.75 m. The Kodappamund channel is the only source of water to the lake and runs for a length of 5.5 km of which 3.06 km is within the Ooty town. Earlier, under National Lake Conservation Plan, remediation of the Ooty lake was successfully done by the Public Works Department. But, due to the continued letting in of sewage water, the quality of water has deteriorated and is not up to the standards now. For the remediation of the lake, PWD has proposed to adopt a Nano Bio remediation process at a cost of ₹5.00 lakh under which nutrient powder will be used in the aerator which will generate diatom to fix oxygen in the water, enabling the growth of zoo-planktons in the water which will basically absorb all the organic matter and clears the water faster compared to simple aeration process. Also, some of the following course of action is proposed to be taken up in the order of priority for the Revival of Ooty lake.

- Uthagamandalam Municipality, to take steps to give sewage connections to 6745 households to stop the inflow of sewage into the lake.
- Desilting of Kodappamund channel at a cost of ₹1.2 crore, Setting up of a two MLD Sewage Treatment Plant (STP) at entry point of lake as an additional safety measure at a cost of ₹2.00 lakh and Improving the quality of the treated water at STP , Kandhal with a trial run of bio-remediation measures are to be done by PWD. Construction of check dams across the Kodappamund channel at strategic points will be carried out by Agriculture Engineering Department.
- An annual grant of ₹10.00 lakh for the maintenance of the Kodappamund channel may be provided to Water Resources Department, PWD. Setting up of four diffusers for continuous aeration of the lake has also been contemplated.
- Formation of a Lake Management Committee under the Chairmanship of the District Collector with representatives from PWD, Municipality, TWAD Board, TANGEDCO, TNPCB, Tourism Department, Forest Department, TNAU, local representatives, reputed NGOs etc., in order to monitor the water quality levels so that lake would remain fresh and pure in future.

Waste Management

Biomedical Waste Management

In order to collect, segregate and dispose the bio medical waste, Government of India, Ministry of Environment and Forest, New Delhi enacted separate rules

Fig. 15.2.7: BMW collection in Hospitals

Fig. 15.2.8: Common BMW treatment and disposal

namely Bio Medical Waste (Management and Handling) Rules 1998. The Government of Tamil Nadu appointed TNPCB as prescribed authority and also constituted a State Level Advisory Committee for monitoring and implementation of above said rules.

The Action Plan for the plan period are awareness and training to paramedical staff for safe handling or infectious biomedical waste in 32 districts at three level, introduction of separate collection, transportation and treatment system (independent of Municipal Corporation),Demonstration of treatment technologies suitable for each category of biomedical waste, carrying out EIA (Environment Impact Assessment) at sites where biomedical waste is treated and disposed of and Town wise inventorization of biomedical waste generated from educational and Research and Development institutions.

Plastic Waste Management

MoEF has provided financial assistance to various State Pollution Control Boards for organizing training, workshops and public awareness on management of Plastic Waste.

The Government of Tami Nadu is a pioneer in the introduction of plastic road technology during 2003-2004, to prevent environmental hazards due to accumulation of plastic wastes. This cost effective and environment friendly way of laying roads has been revived and administrative sanction has been accorded for covering 446.50 km at an estimated cost of ₹50 crore allocated during 2011-2012. As the response is very positive for laying plastic roads, this scheme is continued during the Twelfth Five Year Plan period also and new works to the extent of ₹100 crore will be taken up in the year 2012-2013 out of Environment Protection and Renewable Energy Fund. It is proposed to take up this project with Rural Development Department and the Municipal Administration Department.

Fig. 15.2.9: Re-laying of Roads with Plastic Waste

The Action Plan for the plan period are research and development on recycled plastic /throw away plastics, carry bags (non degradable), laying of rural roads with plastic wastes and rehabilitation of livelihood of rag pickers/slum dwellers and conducting awareness creation programmes.

Fly Ash Management

The various action points that needs to be taken up in Fly Ash management are conducting post EIA studies around Town panchayats, introduction of fiscal incentives for promotion of use of fly ash products, promotion of green belts and landscaping of fly ash disposal sites, demonstration of alternate technologies for use of fly ash and conducting awareness and training programmes to the workers and owners of brick industries.

Municipal Solid Waste Management (MSW)

The various action points which need to be taken up during the Twelfth Plan are conducting surveys for qualitative & quantitative estimation of MSW (Town wise) and preparation of status report on the existing system of collection, transportation, treatment and disposal of MSW, preparation of EIA reports of the existing disposal sites and carrying out remedial measures, creation of public awareness on hazardous of MSW and the methods of segregation, re-use and recycle of wastes, execution of proper collection and transportation system for MSW, provision of low cost solid waste treatment system near large vegetable markets, preparation of Management plans and after identifying (town wise) waste disposal sites treatment technologies and implementation, reclamation of filled up land – fill sites, training to Municipal Corporation workers and rag pickers on proper handling, transportation & treatment of MSW, updating MSW treatment sites and creation of green belts. This is discussed in detail in the Chapter 7.2.Urban Development.

Hazardous Wastes Management

TNPCB is taking effective steps for safe handling of hazardous wastes including collection, treatment, storage, transport and disposal in an environmentally sound manner

Bio-remediation of contaminated site in Ranipet Area, Tamil Nadu

More than two lakh tones hazardous waste (HW) generated over a period of 20 years were dumped by M/s. Tamil Nadu Chromates and Chemicals Limited (TCCL) on an unsecured land area of 3.5 hectares within its premises located at Ranipet industrial area, Tamil Nadu. The TIDCO (Tamil Nadu Industrial Development Corporation Limited) furnished proposals for its containment at a cost of ₹25.00 crore. National Environmental Engineering Research Institute (NEERI) finalized draft report for containment. This work will be executed during the plan period.

Fig. 15.2.10: Hazardous Waste Management , Gummidipoondi

The major action points to be taken up during the plan period:

- Issue of authorization and strict implementation of existing rules for transportation, handling and storage of hazardous chemicals.
- Industry-wise Inventorization of hazardous chemicals and waste as per the latest amendments to HW Rules.

- Preparation of on-site and off-site emergency plans.
- Creation of Emergency Response Centres and Crisis Management Groups at district level.
- Setting up of Poison Control Centres and provision of detailed data base of antidotes/treatment to be provided during a chemical accident to Crisis Management Group.
- Preparation of temporary storage facilities for hazardous wastes within Industrial premises.
- Guidelines for collection and disposal of expired hazardous chemicals.
- Notification of identified hazardous waste disposal sites.
- Carrying out Pre and Post EIA studies for disposal sites.
- Issuance of contracts for preparation of treatment/disposal sites.
- Pre-treatment of hazardous wastes by individual units.
- Setting up of waste exchange banks.
- Training to personnel handling hazardous wastes and managing waste disposal sites.
- Public awareness campaigns.
- Regular monitoring of air, water and soil quality (including ground water) within 10 kms radius of each site.
- Strengthening and equipping coast guards for interception, monitoring, prevention of combating operations for hazardous wastes dumped in marine waters.
- Demonstration of technologies for hazardous waste treatment.

E-Waste

The Ministry of Environment and Forests (MoEF), constituted a committee to evolve a 'Road Map' for Management of Wastes (including E-waste Management) in the country. Accordingly, a draft road map on E-waste management has been prepared, some of the issues covered were strengthening of Legislative Frame Work, developing a mechanism to check illegal import of E-waste, phasing out hazardous substance in Electrical Electronic Equipments (EEE) to the extent possible, revisiting import provisions in SEZ Regulation, development of mechanism for Collection of Electrical, Electronics Equipment (EEE) waste, preventing dumping of used /old equipment, study of International Practices for Management of E-waste, sharing of Information/Technology and reduction of Hazardous Substances in EEE. In accordance with the guidelines issued by the MoEF, GOI it is proposed to carryout research and development work on E-waste.

Critically Polluted Industrial Clusters/Areas

On the Comprehensive Environmental Pollution Index (CEPI) scale by MoEF, GOI, 43 such industrial clusters, having a CEPI greater than 70 on a scale of 0 to 100, have been identified as critically polluted based on the parameters related to incidence of pollution in water, land ground water. For restoration of environmental quality in these polluted clusters, State Pollution Control Boards (SPCBs) /Pollution Control Committees (PCCs) have submitted the Action Plans for these polluted clusters. The Action Plans are being examined by the CPCB to ascertain whether these plans are effectively implementable in the field for improving the environmental quality in these clusters.

Due to the noncompliance with Zero Liquid Discharge (ZLD) norms by Common Effluent Treatment Plants (CETPs) in Tiruppur, these units were closed, leading to a total paralysis of the textile industry and affecting the livelihood of lakhs of workers. Seeing their plight, the Government of Tamil Nadu announced that ₹200 crore will be provided as interest free loan to revive these CETPs with the installation of ZLD facilities using advanced technologies. On that basis, ₹179.34 crore was sanctioned to revive 18

CETPs. Further, ₹75 crore was also provided as an advance to settle the compensation amount due to the Noyyal Ayacut farmers and 475 farmers have already benefited. The CETPs shall recommence their work shortly thus reviving the textile industries in the State. It is proposed to carryout remedial measures to control pollution in the above areas/clusters also.

Box 15.2.4: Clean Development Mechanism (CDM)

CDM is a market driven instrument to reduce carbon emissions and was introduced as part of the Kyoto Protocol by the international community.

Carbon credits and carbon markets are a component of national and international attempts to mitigate the growth in concentration of green house gases (GHGs). One carbon credit is equal to one metric tonne of carbon dioxide, or in some markets, carbon dioxide equivalent gases. Carbon trading is an application of an emissions trading approach.

An industrialised Country that wishes to get credits from a CDM project must obtain the consent of the developing Country hosting the project that the project will contribute to sustainable development. Then, using methodologies approved by the CDM Executive Board (EB), the applicant (the industrialised country) must make the case that the carbon project would not have happened anyway (establishing additionality), and must establish a baseline estimating the future emissions in absence of the registered project. The case is then validated by a third party agency, called a Designated Operational Entity (DOE), to ensure the project results in real, measurable, and long-term emission reductions. The EB then decides whether or not to register (approve) the project. If a project is registered and implemented, the EB issues credits, called Certified Emission Reductions (CERs), commonly known as carbon credits, where each unit is equivalent to the reduction of one metric tonne of CO_2e, e.g. CO_2 or its equivalent), to project participants based on the monitored difference between the baseline and the actual emissions, verified by the DOE.

Diverse portfolio includes projects in CDM that fall into one of three groups:

Renewable Energy Projects: moving India towards a clean and sustainable energy future such wind, solar, biomass, biogas, landfill gas, reforestation etc.

Energy Efficiency: creating lasting change in the way energy is used such as technology transfer in industry, no tillage in farm land, replacement of fossil fuel etc.

Improved land management: working with landholders to lock up carbon emissions such as tree plantation etc.

Source: MSSRF,Chennai

Clean Development Mechanism in Tamil Nadu

CDM could be looked in the context of Tamil Nadu state in the following ways:

- Opportunities exists in Tamil Nadu for substantial reduction in carbon emissions through the CDM process especially in the areas of biomass and bagasse cogeneration, solar, landfill gas etc to reduce global emission.
- Tamil Nadu is the leader in wind energy production (6547.89 MW) and is already exploiting the benefits of CDM. The potential for enhancing the capacity exists and this will add on to the portfolio of CDM projects in future.

Scope of CDM

- There is vast scope to increase agricultural income through a variety of means that would entail CDM benefits for the state. Currently the CDM benefits through agricultural interventions have not been exploited. Use of renewable energy and ensuring energy efficiency in irrigation is one area which offers a huge opportunity.
- In other agri - context, it is pertinent to mention here that the bagasse cogeneration CDM projects in sugar mills have a definite potential to stabilise the income of the cane growers by improving the economic viability of the sugar mills. The sale of power generated through bagasse and sale of CERs from such a CDM project activity can yield handsome dividend and improve profitability of sugar industry.
- Projects on generation of renewable energy aim to sell electricity primarily through state electricity grid and/or use it for self-consumption within the premises of the commercial enterprise (captive power consumption). The grid connected projects emphasize their contribution to socio-economic development through: (1) generation of additional income to farmers through sale of crop residues and other biomass, which was otherwise being under-utilized or burnt due to its negligible commercial value (2) generation of direct employment in the construction stage of the plant and later for the maintenance of the same (3) indirect employment generation in collection and transportation of the biomass from fields to the plant site (4) additional employment generation and infrastructural development in the project area as a result of setting up of rural industries consequent on establishment of the power plant in the area.

The reforestation projects also offer enormous scope to derive CDM benefits in the State. Apart from providing income the reforestation programmes would be helpful in poverty alleviation and enhancing the livelihoods of the poor and vulnerable.

Cross Cutting Issues –Key Issues and Major Interventions

State Action Plan on Climate Change (SAPCC)

The Department of Environment, GoTN has been designated as the nodal department for the development of SAPCC and GTZ (German Technical Cooperation now renamed as GIZ) is identified as a technical institutional partner. The funding is by Ministry of Environment and Forests, Government of India. The SAPCC for Tamil Nadu is to be prepared as per guidelines of the Ministry of Environment and Forests, GOI. With the coordination of the line departments, it is proposed to prepare a SAPCC for Tamil Nadu. To initiate the preparation of the SAPCC, an inception workshop was organized in Chennai. Head of Departments, officers of line departments, Agencies /Boards/ Corporations / Stakeholders participated in the workshop. From the outcome of the inception Workshop, it has been proposed that the project concept be grouped into the following sectors. a) Water Resources b) Coastal Area Management c) Sustainable Agriculture d) Forest & Bio-Diversity e) Energy Efficiency and Renewable Energy

f) Solar Mission g) Sustainable Habitat and h) Knowledge Management.

Environmental Health

Long term studies to find out any co-relationship between the dose and the response would be useful for evolving strategies for the protection of human health. The key benefit will be in evolving strategies for health risk reduction. It will also strengthen the comprehensive approach to environmental health management plans, which would constitute a systematic approach to estimate the burden of disease and injury due to different environmental pollutants.

Market Based instruments (MBIS) for environmental management in Tamil Nadu

In recent years, polluting units are being closed down due to court intervention and lack of efficiency of the present pollution control policy is to be blamed for this. This being the case, the current pollution control policy has to be revamped rigorously. In this direction, introducing 'economic instruments' under the present pollution control regime in an appropriate manner is expected to achieve better environmental quality in the State in the coming years.

Environmental Accounting

Adopting an Environmental Accounting Framework shall be done in terms of not only strengthening environmental information system but also improving the environment of the state as well. Environmental Accounting will have to be initiated for important environmental resources namely, water, land, forests, biodiversity, fisheries and air quality. In the case of water, 'river basin' should be used as a unit of measurement for environmental accounting purpose.

Economic Valuation of Environment

Economic valuation of environmental services and damages becomes an integral part of an environmental policy that encompasses economic instruments. Environmental resources–forests, water and biodiversity provide substantial amount of services to various economic activities; when these services are over-utilized or when they are affected by pollution, we have problems of depletion and degradation. So, there is a need for estimating the economic value of services and damages so that environmental policies can be suitably modified in order to address the above concerns.

Flexibility in setting pollution parameters

The standard-setting of pollution parameters should be modified on the basis of above criteria at regular intervals. Online monitoring of pollution parameters by all the

Box 15.2.5: Concept of Science Park in the State

The main emphasis of the work of the Science Park is facilitating the integration of a developmental approach into science, technology and innovation, Organizing capacity building, providing policy advice and facilitating the exchange of experience and best practices / conducting Research.

Opportunities

Many developing countries have experienced the following opportunities linked to the development of science parks:

- Great potential to develop a knowledge-based economy
- Communication system is increasingly available
- Availability of universities, research institutes/centres and researchers
- Great potential market for knowledge-based products

District Environmental Engineers with the provision of laptops and other devices shall be executed during the Plan period.

Institutional Strengthening

It should be noted that for the first time in South Asia, two River Basin Boards have been created for Palar and Thamaraparani in Tamil Nadu. The river basin boards could play a pivotal role in managing water, land, biodiversity and fisheries at the basin level. Since the basin boards consist of various stakeholders, water policies in particular can be formulated and implemented effectively. However, the basin boards are defunct and they need to be activated during the plan period.

Box 15.2.6: Network of Long-Term Ecological Observatories

- Need to set up a number of ecological observatories at representative sites of the different biomes in the country. (e.g. Mangroves, Western Ghats etc.)
- Hierarchy of studies from the eco physiology of individual species to community-level and landscape level monitoring using remote sensing through multi-institutional collaboration

Source: Project Management Cell, National Communication to United Nations Framework Convention on Climate Change, Ministry of Environment and Forests

Public Private Partnership (PPP) in the Environment Sector

Environmental governance implies how different institutions – governments, firms, markets, individuals and households, NGOs and civil society organizations- can collectively contribute to sustainable development. The role of 'private sector' in managing the environment has been recognized as an important component of environmental governance. Various types of public-private arrangements have been identified and implemented in different avenues of environment and infrastructure.

Public Private Partnerships shall also be explored in the following Sectors / Schemes

- To recycle industrial and domestic waste water generated during domestic and industrial uses.
- To develop bio-shields along the coast of Tamil Nadu (wherever possible).
- To maintain water bodies through PPP, particularly tanks and brackish water lakes – declare them as tourist spots –to explore popularizing solar energy at the household level.
- Develop exclusive green space / lung space through PPP in the major urban centres.
- On compulsory rainwater harvesting structures in all corporate, educational and government buildings.
- On recycling of wastewater generated in all corporate, educational and government buildings.
- A good PPP model should be developed to rejuvenate and maintain city water ways and declare the city water ways as the lung space of Chennai.

Integrated Coastal Zone Management Plan

The Ministry of Environment and Forests, Government of India has promulgated Coastal Regulation Zone Notification 2011 in super session of Coastal Regulation Zone Notification 1991.

The discharge of untreated waste and effluents from industries, cities or towns and other human settlements, dumping of city or town wastes including construction debris, industrial solid wastes, fly ash for the purpose

of land filling in Coastal Regulation Zone are declared as Prohibited activities under CRZ Notification 2011 and the Notification also insists for phasing out existing practice within a prescribed time limit. Coastal area up to 12 nautical miles and the tidal influenced water bodies have been included under the Coastal Regulation Zone.

At several coastal stretches of the country the fishermen and their dwelling units are in danger due to erosion, which is occurring primarily due to manmade activities. The development of such man made foreshore activities shall be regulated after identifying and demarcating the coast as falling in the high eroding category, the medium eroding category or the stable sites category.

In order to achieve the objectives of CRZ Notification 2011, Ministry of Environment and Forests, GOI has requested all the Coastal States to prepare Integrated Coastal Zone Management Plan and necessary proposals for the preparation of ICZMP in respect of Tamil Nadu have been sent to GOI for inclusion in the phase II.

The financial outlay of ₹80.00 crore is proposed for the Twelfth Plan Period to take up the above programmes as the cross cutting issues.

Pallikaranai Marsh land has a sensitive ecology and is home to 195 different species. The Government has sanctioned a five year programme to take up its ecological restoration and conservation at a cost of ₹15.75 crore during the Twelfth five year plan, with an outlay of ₹5 crore during the year 2012-13. Focus will be given in restoring the ecological balance in the Adyar estuary. The Gulf of Mannar Biosphere Trust will be funded by the State Government after the UNDP funding comes to an end by December, 2012.

Capacity building

Strengthening of Environment Department

It is proposed to form District Offices, in the districts of Cuddalore, Ramanathapuram, Thoothukudi, Trichy, Coimbatore and Vellore. The Deputy Directors will be working under the control of Director of Environment at State Level, and will assist the respective District Collectors at District Level. The financial outlay of ₹3.00 crore is proposed for the plan period.

Reconstitution of Environmental Management Agency of Tamil Nadu (EMAT)

Pursuant to the suggestion made by the Hon'ble Chief Minister of Tamil Nadu, it was decided to create an Environmental Management Agency of Tamil Nadu with the following activities during the plan period.

- Reversal of schemes identified by Loss of Ecology Authority of Tamil Nadu in various Districts of Tamil Nadu with the help of line departments. EMAT will be the Monitoring and funding agency.
- Water Quality Monitoring to be undertaken in the water bodies (rivers/lakes) of Tamil Nadu.
- Critically polluted areas already identified by CPCB in Tamil Nadu. EIA studies will be undertaken to draw up Management plans in the respective areas.
- Awareness/Training programmes.
- Activities of State Action Plan on Climate Change and Adaptation Research.
- Provisions for Creation of Environmental Management and Training Institute and the works will be implemented through EMAT.
- Eco-Restoration Plans for all temple tanks owned by Hindu Religious and Endowment Department will be executed by EMAT.

- Lake Conservation programme for the 21 lakes already identified by EMAT will be implemented.

In General the schemes related to Environmental Conservation and Management funded by both Government of India and Government of Tamil Nadu will be implemented through EMAT in future. The organizational structure will be modified accordingly.

Financial Outlay for the Twelfth Five Year Plan Period

Table 15.2.2: Twelfth Plan Outlay - Environment and Climate Change

(₹ crore)

Department / Board	Component	Proposed Outlay
Tamil Nadu Pollution Control Board (TNPCB)	Air Quality	10.00
	Water Quality	5.00
Department of Environment	Environmental Management	22.00
	Waste Management including plastic waste management	100.00
	Cross Cutting Issues	80.00
	Capacity Building	3.00
	Ongoing programmes	16.50
	Total	**236.50**