

15. ENVIRONMENT

Environmental degradation seriously threatens economic and social progress even at the global level. Increasing craze for mega cities and high tower buildings without considering the width of the roads and parking areas have been causing further congestion and damages to the environment thereby degrading the environment much faster than economic growth. Environment and economic growth are complimentary for developing countries and competitive for developed countries.

Hence environmental protection has become a continuous crisis of the nation. The complex growth of environmental pressures due to the rapid population growth, mushrooming growth of industrialization and the unprecedented rate of urbanization insists upon the urgent need to pursue economic development at any cost. As sustainable development is the need of the hour, which is possible only by promoting awareness about the need to protect environment the Government has taken several initiatives.

Government of Tamil Nadu set the following objectives to be achieved during the Tenth Five Year Plan by the Ecology and Environment sector.

- Environmental protection and reduction of wastes at source;
- Conservation and enhancement of high support systems like land, water, forests, bio-diversity, ocean and the atmosphere;
- Promotion of suitable measures and technologies for the recycling of pollutants;
- Emphasizing the environmentally safe waste disposal options;
- To prevent environmental degradation and ensure genetic diversity; and
- Promotion of environmental awareness at all levels.

Ecology and Environment Sector – Tenth plan performance:

Department of Environment and Tamil Nadu Pollution Control Board are entrusted with the task of achieving the plan objectives of the State. While the Department of Environment was involved in the task of abatement of pollution in rivers and lakes besides promoting environmental consciousness, Tamil Nadu Pollution Control Board was involved in monitoring, pollution and abatement of pollution of all kinds in the State.

An outlay of Rs.197.20 crores was allocated to the Ecology and Environment sector during the Tenth Plan period. The Department of environment received a major share of Rs.113.05 crores as State's contribution and Rs.27.73 crores as Central fund thereby making it to a total of Rs.140.78 crores. From the balance of Rs.56.42 crores, the Tamil Nadu Pollution Control Board was allotted Rs.42.02 crores as central assistance and mobilized Rs.14.40 crores by itself.

Table-1: Allocation of Funds (X plan period)

(Rs. in crores)

| Sl. No. | Department/Agency | State Fund | Central Fund | Fund from Internal / own mobilization (Board resources) | Total |
|---------|------------------------------------|---------------|--------------|---|---------------|
| 1. | Tamil Nadu Pollution Control Board | --- | 42.02 | 14.40 | 56.42 |
| 2. | Department of Environment | 113.05 | 27.73 | -- | 140.78 |
| | Total | 113.05 | 69.75 | 14.40 | 197.20 |

Source: 10th Five Year Plan document of State Planning Commission.

The scheme-wise details of actual expenditure incurred by the Ecology and Environment sector during the five year period are presented below.

Table- 2: Year-wise and Scheme-wise Expenditure

(Rs. in lakhs)

| Sl. No. | Year | Environmental research & Ecological Regeneration | Control of Pollution | Total (Rs. in lakhs) |
|---------|--------------|--|----------------------|----------------------|
| 1. | 2002-03 (A) | 51.22 | 5.62 | 56.84 |
| 2. | 2003-04 (A) | 75.69 | 2005.92 | 2081.61 |
| 3. | 2004-05 (A) | 69.89 | 6.70 | 76.59 |
| 4. | 2005-06 (A) | 93.03 | 6.20 | 99.23 |
| 5. | 2006-07 (A) | 161.03 | 5.61 | 166.64 |
| | Total | 450.86 | 2030.05 | 2480.91 |

Source: Performance budget of Environment Dept.

Of the total allocation of Rs.140.78 crores for the Department of Environment, a sum of Rs.24.81 crores was spent towards various schemes such as prevention of air and water pollution, environmental awareness and environmental research.

The fact that funds to the extent of approximately 18 percent of the total allocation had been utilized for various schemes during the Tenth Plan period, which emphasizes the urgent need to create more awareness on environmental issues and adoption of sufficient technology to prevent the pollution. A maximum amount of funds (Rs.2081.61 lakhs) had been utilized during 2003-04. Of this, nearly 96 percent of the funds were fully sponsored by the Central Government towards Chennai City Water Ways Programme. Of the total expenditure incurred by the Ecology and Environment sector, the share of centrally sponsored schemes worked out to 14.21 percent.

Progress of Major schemes implemented during the 10th Five Year Plan period

The Department of Environment was entrusted with the task of implementing the major schemes such as providing green cover for clean air, abatement of river pollution under National River Conservation Programme, National Lake Conservation Programme etc. which had been carried over from the Ninth Five Year Plan. In addition to the above, the following schemes had been proposed and implemented during the Tenth Five Year Plan.

- ❖ Conservation of Coastal Eco-system;
- ❖ Land management;
- ❖ Preparation of Status of environment report;
- ❖ Conservation of Wet land eco-system;
- ❖ Eco-cities programme;
- ❖ Bio-diversity conservation Net work;
- ❖ Environment Research and Development;
- ❖ Agency for Environmental Projects; and
- ❖ Environment education and awareness.

Table- 3: Progress of Major Schemes Implemented during the Tenth Five Year Plan Period

| Sl. No. | Name of the Scheme/Programme | Funding Pattern | Achievements during the Five Year period (Rs. crores) | | | | | |
|---------|---|--------------------------|---|---------|---------|---------|---------|---------|
| | | | 2002-03 | 2003-04 | 2004-05 | 2005-06 | 2006-07 | 2007-08 |
| 1. | National River Conservation Plan-5 polluted stretches | 100% Centrally sponsored | 16.58 * | 1.23 | 1.64 | 1.6 | 1.26 | 0.13 |
| 2. | Chennai City River Conservation Project (CCRCP) | Centrally sponsored | 119.88 * | 76.7 | 91.72 | 69.93 | 14.07 | 5.41 |
| 3. | National Green Crops | Centrally sponsored | 0.29 | 0.29 | 0.76 | 1.87 | 1.87 | 1.87 |
| 4. | National River Conservation Programme (7 towns) | 50%-Centre 50%-State | 35.32 * | 42.6 | 156.53 | 91.47 | 85.33 | 27.79 |
| 5. | National lake Conservation programme (NLCP) | State Sponsored | 0.92 (91.69 lakhs) | 1.73 | 1.76 | 1.97 | 10.43 | |
| 6. | Eco-system plans:* a) Conservation of coastal Eco-system b) Eco-restoration plan c) Eco-city plan for TV Malai d) Amelioration of Temple Block at Palani | State Sponsored | - | 0.19 | 0.05 | 0.05 | - | |

* -since it's inception.

Source: Compiled from policy notes of Forest and Environment Department (2002-03 to 2008-09).

Abatement of pollution in five polluted stretches:

This cent percent centrally sponsored scheme was implemented since 1996-97 with a project cost of Rs.36.28 crores. The expenditure during 9th Plan period was Rs.12.13 crores and during 10th Plan period, it was Rs.10.18 crores thereby making it to a total achievement of Rs.22.31 crores. The interception, diversion and sewage treatment works at Tiruchy, Kumarapalayam and Erode have been completed. The works at Bhavani are under progress. A revised detailed Project Report for Pallipalayam is under preparation by the TWAD Board. A critical analysis of the scheme indicates that the target period set for the scheme was 10 years and approximately 61.5 percent of the work has been completed in the set target period. Till 2007-08, an amount of Rs.22.44 crores was spent towards this project.

National River Conservation Programme in seven additional towns:

Pollution abatement in seven towns viz., Srirangam, Thanjavur, Kumbakonam, Inam-Karur, Mayiladuthurai, Madurai and Tirunelveli around the rivers of Cauvery, Vaigai and Tamiraparani were implemented at a cost of Rs.575.30 crores during 2001. Government of India granted a sum of Rs.282.15 crores for this project and the rest was borne by the Government of TamilNadu. An amount of Rs.411.25 crores was spent till the 10th Plan period thereby indicating an achievement of 71.48 percent within a period of six years. During 2007-08, a sum of Rs.27.79 crores was spent, thereby making the total commitment towards this project as Rs.439.04 crores.

Chennai City River Conservation Project:

Intercepting and treating sewage in Chennai city waterways viz., Coovam, Buckingham canal, Adyar, Otteri Nullah, Captains cotton canal and Mambalam drain have been undertaken by the Chennai Metropolitan Water Supply and Sewerage Board during 2001 with the Government of India grant of Rs.491.52 crores. Sixteen packages were completed at a cost of Rs.372.53 crores till 2006-07. Approximately 75.8 per cent of the works were completed during the 10th Plan period. An amount of Rs.5.41 crores was spent towards this project during 2007-08.

National Lake Conservation Programme:

Environmental upgradation through bio-remediation of Ooty and Kodaikanal lake have been undertaken by the State at a total cost of Rs.12.18 crores. Revival of Ooty lake has been completed at a cost of Rs.1.72 crores. The revised detailed project report for Kodaikanal lake has been sanctioned at Rs.10.43 crores. A detailed project report for the revival of Yercard Lake has been prepared by the TWAD Board and the State has agreed to bear 30 percent of the total cost of (Rs.4.37 crores) the project.

National Green Corps:

In order to strengthen environmental awareness among school children, the programme of National Green Corps (NGC) was launched in 29 districts at the rate of 100 schools per district during 2002-03. Government of India approved a grant of Rs.1000/- per each school per year initially. During 2004-05, the number of schools was increased to 4350 with an additional enrollment of 1450 schools. During 2005-06, GOI

increased the grant to Rs.2500/- per school per year and about 4500 schools were launched with the NGC programme at the rate of 150 schools per district. The school strength was increased to 7500 schools with an addition of 250 schools per district during 2006-07 and the total grant by GOI went up to Rs.1.87 crores every year. Nearly 3 lakh children are participating in this awareness programme. Monitoring activities are taken up by the State level and district level steering committees.

Environmental Information System (ENVIS) and State of Environment Report (SOE):

A web-based information system ENVIS was sponsored by the GOI to provide information about the State of environment of Tamil Nadu, the rich bio-diversity of the State and the river cleaning activities undertaken by the State. An amount of Rs.10.92 lakhs was sanctioned by the GOI for this programme.

In addition to the above web-based information, the preparation of the State of Environment Report was undertaken by the GOI at a cost of Rs.12.50 lakhs during 2006. Twelve district level consultation workshops were conducted under the programme.

Environmental awareness Camps, Competitions and Education:

To create environmental awareness and consciousness among the general public, wide publicity is given on World Environment Day, Ozone Day and Bhogi Day of every year. Awareness programmes have also been successfully implemented in select tourist spots and hill stations. Around 3.5 lakh students are involved in the awareness movement of National Green Corps / Eco. Clubs and an amount of Rs.1250/- per year per eco-club was spent for this purpose.

Environmental Awards and Research and Development Programmes:

Three reputed organizations viz., Centre for Environment studies-Anna University, CPR Environment Education Centre and Bharathiar University are involved in conducting research projects in the line of environment at a cost of Rs.9.78 lakhs. A Rapid Environmental Impact Assessment of Tsunami affected coastal and marine areas has been undertaken during February – March 2005 at a cost of Rs.10 lakhs and a sum of Rs.4.94 lakhs has been utilized so far under this project.

As a honour the best NGOs, experts and individuals are awarded by the State in recognition of their contribution towards environmental development on the World Environment Day.

The Tamil Nadu Pollution Control Board has carried over schemes such as Hazardous waste management, strengthening of TNPCB laboratories, Environmental Information system, coastal monitoring programme, Education and training, Air Quality Monitoring and Environmental Management from the Ninth Five Year Plan with the State fund of Rs.6.05 crores and central assistance of Rs.2.02 crores (Total Rs.8.07 crores). Apart from the above existing schemes the board was entrusted with the following 12 new schemes at a total cost of Rs.48.35 crores.

1. Formation of New District Offices.
2. Construction and upgradation of TNPCB laboratories.
3. Cleaner Technologies.
4. Drinking water protection.
5. Solid waste management.
6. Vehicle Emission monitoring.
7. Research and Development.
8. Environmental education.
9. Environmental impact assessment.
10. Environmental Epidemiology studies.
11. Environmental Health Cell and
12. Institute of Environmental Management.

The funds for the above schemes were mobilized by TNPCB to the extent of Rs.8.35 crores and central assistance was provided to an extent of Rs.40.00 crores.

Waste Management:

The Government is taking effective steps in the handling of hazardous wastes and chemicals and in the management of bio-medical wastes, plastic wastes and municipal solid wastes.

Till 31.01.2002, 1,180 units were identified as generating hazardous wastes under hazardous waste (Management and Handling) Rules 1989. Three sites, one at SIPCOT Industrial Estate-Chennai, another at Tiruppur taluk of Coimbatore district and yet another one at Krishnarayapuram taluk of Karur district were identified for establishing common Hazardous Waste Treatment Storage and disposal facility.

During the 10th Five Year Plan period ,1430 more units have been identified as generating hazardous wastes under the Hazardous wastes (Management and Handling) rules amended in 2000 and 2003. Work at SIPCOT Industrial Estate has commenced from the second week of March 2007.

Under the Bio-Medical Waste (Management and Handling) Rules, 1998, 2479 Private hospitals and 317 Government hospitals were covered upto the 10th Plan period. During 10th Plan period 1074 Private hospitals and 75 Government hospitals have been covered to ensure that the biomedical wastes are handled without any adverse effect to human health and environment. For the private sector health care units, 11 sites have been identified to establish biomedical waste treatment and disposal facility of which ten locations established at Kancheepuram, Coimbatore, Thanjavur, Vellore, Salem, Nilgiris, Ramanathapuram, Virudhunagar and Thirunelveli districts are under operation and the remaining one location at Coimbatore will commence shortly. For the Government hospitals around Chennai, a deep burial facility is provided at Kodungaiyur, Chennai. All the district headquarters hospitals, Public Health Centres and isolated health care units are suggested to follow the deep burial facility or to join the private facilitators for the disposal of bio-medical wastes.

Under Municipal Solid Wastes (Management and Handling) Rules, 2000, the solid wastes are segregated as wet compostable waste, dry recyclable waste, inert wastes,

construction debris and domestic hazardous wastes. All the Municipalities are involved in the segregation of wastes at source. So far, 63 Municipalities have been given the authorization for setting up waste processing facility and NOC has been given to 41 Municipalities and one Corporation. To develop model towns in solid waste management, the Board has granted a seed money of Rs.2 lakhs to each Municipality (or) Rs.1 lakh to each special Village Panchayat in each district. Apart from this, a sum of Rs.1.00 crore was allotted for eight Municipalities during the year 2007-08 for the implementation of solid waste management practices.

As per the Plastic Manufacture and Usage (Amendment) Rules 2003, the public and the plastic product manufacturing units were instituted to use eco-friendly substitutes for plastic items and for packaging food stuffs, only virgin plastics, permitted additives and colours were recommended. So far, the Government has issued the consent to operate to 1732 plastic product manufacturing unit.

Electronic Waste (e-waste) Management:

Tamil Nadu consists of around 1350 Small / Medium/ Large scale software companies. This increasing pace of IT and electronic industries has resulted in an equal amount of rise in 'electronic wastes' (e-wastes). A major portion of about 70 percent of the e-wastes are generated by the government public and private sectors followed by individual households at 15 percent and the rest 15 percent by other sources such as computer manufacturers and illegal import of e-wastes. A five member committee of officials of Anna University, Toxics link an NGO and National Metallurgical Laboratory was formed to address and discuss the various issues of e-waste management such as lead, mercury, cadmium and other toxic compounds. Following guidelines were arrived at by the committee for the software companies.

- i. Software companies with Gross Fiscal Assets (GFA) of more than one crore shall obtain consent under water act and air act and shall obtain authorization under Hazardous wastes (M&H) rules 1989 as amended.
- ii. All the software companies and industries shall ensure that the e-wastes generated from their institutions shall be disposed through the authorized recyclers as approved by TNPCB.

Apart from the above, the customs officials are instructed to furnish a quarterly statement of e-wastes imported through the Chennai Port. Around eight recycling plants are located at Chennai, Kancheepuram, Thiruvallur and Krishnagiri districts in Tamil Nadu.

Monitoring of Industries:

Water and Air Pollution Control:

In order to monitor the pollution due to industrial sources, the industries are categorized as Red, Green and Orange according to their pollution potential. From August 2007 onwards, the highly polluting red category industries have been split as ultra red and red category in order to exercise effective monitoring. Industries are required to obtain the 'consent for establishment' and 'consent to operate' for the discharge of sewage / trade effluent into any streams or well or into sewer or land under Water Act 1974 and

Air Act 1981. During the period from 1995-96 to 2006-07, the Board has issued the consent orders numbering 7058 for establishment of industrial units under Water Act and 6986 orders under Air Act. From 1982-83 to 2006-07, 26,050 units under Water Act and 23197 units under Air Act were given the consent to operate .

Table - 4: Details of Consent Given to Industrial Units during Xth plan period

| Sl. No. | Period | Under Water Act | | Under Air Act | |
|---------|----------------------------------|----------------------|--------------------|----------------------|--------------------|
| | | Consent to establish | Consent to operate | Consent to establish | Consent to operate |
| A | From 1995-96 to 31.01.2002 | 2989 | 19455 | 2929* | 16666* |
| B1 | 01.02.2002 to 31.01.2003 | 442 | 1025 | 441 | 1049 |
| 2. | 01.02.2003 to 31.03.2004 | 701 | 1179 | 698 | 1114 |
| 3. | 01.04.2004 to 31.12.2004 | 690 | 1004 | 684 | 999 |
| 4. | 01.01.2005 to 31.03.2006 | 1212 | 2294 | 1210 | 2275 |
| 5. | 01.04.2006 to 31.03.2007 | 1024 | 1093 | 1024 | 1094 |
| | Total (B1 to 5) | 4069 | 6595 | 4057 | 6531 |
| | Grand Total (A + B) | 7058 | 26050 | 6986 | 23197 |
| | % of total to Grand total | 57.65 | 25.32 | 58.07 | 28.15 |

• - From 1982-83 to 31.01.2002.

Source: Compiled from policy notes of Forest and Environment dept. (2002-03 to 2007-08).

About 58 percent of the industrial units had obtained their consent to establish under Water Act and Air Act during the 10th Plan period. Similarly, 25 percent of industrial units under Water Act and 28 percent of the units under Air Act had obtained their consent to operate during the same period.

Legal action has also been taken against the erring industries for not complying with the pollution control laws. So far, show cause notices to 34,973 industries and closure order to 5417 industries had been given. Break-up during the 10th Plan period is presented in the following table.

Table - 5: Legal Action Taken by the Government

| Sl. No. | Period | Show cause notices issued (Nos.) | Closure orders issued (Nos.) |
|---------|-----------------|----------------------------------|------------------------------|
| 1. | Till 31.01.2003 | 24461 | 4095 |
| 2. | Till 31.03.2004 | 28793 | 4279 |
| 3. | Till 31.03.2005 | 29131 | 4401 |
| 4. | Till 31.03.2006 | 34973 | 5417 |

Source: Compiled from Policy Notes of Forest & Environment (2002-03 to 2007-08).

Common Effluent Treatment Plants (CETPs):

The clusters of small scale industries, which are subject to financial strains and lack of space are assisted by TNPCB in the establishment of CETPs. A list of CETPs formed and under operation during the 10th Plan period is presented below.

Table – 6: Details of CETPs

| Sector | No. of CETPs formed | | | | | | No. of CETPs under operation | | | | | |
|-----------------------------|---------------------|-----------|-----------|-----------|-----------|-----------|------------------------------|-----------|-----------|-----------|-----------|-----------|
| | 2002-03 | 2003-04 | 2004-05 | 2005-06 | 2006-07 | 2007-08 | 2002-03 | 2003-04 | 2004-05 | 2005-06 | 2006-07 | 2007-08 |
| Tanneries | 23 | 24 | 24 | 25 | 25 | 26 | 12 | 13 | 14 | 14 | 15 | 14 |
| Textile bleaching and dying | 27 | 25 | 25 | 31 | 36 | 42 | 18 | 18 | 18 | 18 | 18 | 18 |
| Hotels & Lodging | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Hospitals | 1 | - | - | - | - | - | 1 | - | - | - | - | - |
| Total | 52 | 50 | 50 | 57 | 62 | 69 | 32 | 32 | 33 | 33 | 34 | 33 |

Source: Compiled from Policy Notes of Forest & Environment (2002-03 to 2008-09).

While the CETP for Hospitals (common facilities) was formulated and operated in the initial year of 10th Plan (2002-03), later on it was withdrawn by the TNPCB. Out of 62 CETPs formed till 2006-07, only 34 are under operation viz., 15 for tanneries and 18 for textile dyeing units and one for hotels and lodging were under various stages of implementation. During the period of 2007-08, out of the 69 CETPs formed, only 33 CETPs are under operation. In addition around 36 CETPs schemes are under various stages of implementation.

Prior to the 10th Plan period, the Government of Tamil Nadu sanctioned a subsidy of Rs.26.88 crores to the CETPs of which Rs.22.66 crores was released till 31.03.2003. During 2003-04 to 2005-06 a sum of Rs.2.01 crores was released to Kovai and Perundurai CETPs. The Government of India sanctioned a subsidy of Rs.20.60 crores prior to the 10th Plan period. Of this Rs.19.40 crores had been released through TNPCB, TALCO & IDBI during the 9th Plan period. During 2002-03, a sum of Rs.10.50 lakhs had been released to Pudur CETP.

Cleaner Technology:

In order to protect the environment from ozone depleting substances, TNPCB is involved in the promotion of holistic approach of adoption of cleaner technology to industrial units in a phased manner. ISO 14001 certificate has been issued for 102 industries for maintaining best environmental management system in their plants.

Ambient Air Quality Monitoring (AAQM) Programme:

Due to increased industrial and commercial activities and the vehicular population, the quality of ambient air is affected by the emission from the above activities. As a means of controlling air pollution, Government has established Air Quality monitoring stations under two programmes viz., National Ambient Air Quality Monitoring and State AAQM.

Table - 7: District-wise AAQM

| Sl. No. | District | No. of Air Quality Monitoring Stations | |
|---------|-----------------|--|-----------|
| | | NAAQM | SAAQM |
| 1. | Chennai | 3 | 5 |
| 2. | Coimbatore | 3 | - |
| 3. | Thoothukudi | 3 | - |
| 4. | Madurai | 3 | - |
| 5. | Salem | 1 | - |
| 6. | Tiruchirappalli | - | 5 |
| | Total | 13 | 10 |

Source: Annual Report of TNPCB.

Pollution Control Board has prescribed certain standards for the air quality parameters such as Sulphur Di-oxide (SO₂), Oxides of nitrogen (NO_x), Total Suspended Particulate Matter (TSPM) and Respirable Dust Particulates (RSPM). Table below presents the standards prescribed by the NAAQM & SAAQM.

Table - 8: Standards prescribed by the NAAQM & SAAQM

| Sl. No. | Area | Annual average concentration of pollution in mg/m ³ | | | |
|---------|--|--|-----------------|------|------|
| | | SO ₂ | NO _x | RSPM | TSPM |
| 1. | Industrial | 80 | 80 | 120 | 360 |
| 2. | Residential, Rural and mixed areas including traffic inter section | 60 | 60 | 60 | 140 |

Source: Annual Report – 2005-06 of TNPCB.

If the air qualities of the above parameters fall within the prescribed standards, TNPCB is said to exercise effective control of industrial emissions. IIT, Madras has been assigned with the project to study the Chennai urban air quality and its sources of pollution with a grant from CPCB to the extent of Rs.1.75 crores.

Vehicular Emission Monitoring:

In order to control the emission from goods transport vehicles, vehicle emission monitoring stations are located in Chennai at Alandur, Madhavaram and Amabattur areas and in the other districts at Nilgiris, Katteri, Dindigul, Palani and Chengalpattu. Table presented below gives a picture of the number of vehicles tested for emission and number of vehicles complied with the standards during the period 2002-03 to 2006-07 at Chennai city. Emissions under control certificates are issued to vehicles complied with the emission standards in all the tests.

Table - 9: Number of Vehicles Tested and Complied Standards

| Year | No. of vehicles tested | Vehicles within the limit | % of vehicles complied within the limit | Vehicles exceeded the limit during 1 st test | % of vehicles exceeded limit during 1 st test | Vehicles complied after rectification | Vehicles not complied standards | % of vehicles not complied standards |
|---------|------------------------|---------------------------|---|---|--|---------------------------------------|---------------------------------|--------------------------------------|
| 2002-03 | 41073 | 28968 | 70.53 | 12105 | 29.47 | 10289 | 1816 | 4.42 |
| 2003-04 | 51398 | 38192 | 74.31 | 13206 | 25.69 | 11540 | 1666 | 3.24 |
| 2004-05 | 34553 | 28078 | 81.26 | 6475 | 18.74 | 4944 | 1531 | 4.43 |
| 2005-06 | 32200 | 29892 | 92.83 | 2308 | 7.17 | 1626 | 682 | 2.12 |
| 2006-07 | 31326 | - | - | - | - | - | - | - |

Source: A. Compiled from Policy Notes of Forest & Environment (2002-03 to 2007-08) Dept.
B. Annual Report of TNPCB.

The percentage of vehicles complied within the emission standards had shown an increasing trend. However, the number of vehicles tested over the period from 2002 to 2006 showed a declining trend except during 2003-04. The percentage of vehicles that did not comply with the emission standards during the first test is on the decline. After rectification, around 2 to 4 percentage of vehicles alone did not comply with the emission standards.

The vehicle emission monitoring stations located in the other districts were closed with effect from 16.11.2005 and the emission test in these areas was carried on by the authorized private test centers. In order to control the emission from auto rickshaws, the auto rickshaws which opt for the conversion to LPG fuel are granted subsidy by TNPCCB. Out of the 33,731 existing petrol driven vehicles, 4941 auto rickshaws have already been converted to LPG mode.

Water Quality Monitoring (Drinking Water Protection):

The major rivers of the State are polluted by the untreated sewerage and effluents from the Local Bodies and industries. In order to restore and maintain the wholesomeness of water, TNPCCB is monitoring the inland water quality under two programmes viz., Monitoring of Indian National Aquatic Resources (MINARS) and Global Environment Monitoring System (GEMS). While the quality of river Cauvery is monitored under both the programmes, the quality of rivers Thamiraparani, Palar and Vaigai rivers and Ooty, Kodaikanal and Yercaud lakes is monitored by the GEMS Region and funded by the Central Pollution Control Board.

The physico-chemical and biological parameters of water quality are analysed and standards are prescribed between A and E as their 'Designated Best Use' (DBU). The classification of water according to DBU is given below.

- A - Drinking water source without conventional treatment but after disinfection.
- B - Outdoor bathing
- C - Drinking water source with conventional treatment followed by disinfection.
- D - Fish culture and wild life propagation.
- E - Irrigation, Industrial cooling and controlled waste disposal.

Table-10 presents the DBU class of rivers and lakes under MINARS and GEMS programme.

Table – 10: Water Quality Monitoring Programmes

| Classification of Water – DBU | MINARS | | GEMS Rivers (Cauvery) |
|-------------------------------|---------------------------------|----------------------------|---|
| | Rivers | Lakes | |
| A | - | - | - |
| B | Palar, Vaigai and Thamiraparani | Kodaikanal | Musiri ferry gate, Musiri borewell and Mettur |
| C | Cauvery | Udhagamandalam and Yercaud | Pallipalayam |
| D | - | - | - |
| E | - | - | - |

Source: Annual Report of TNPCCB

It is observed from the above table that the selected rivers and lakes for monitoring falls under DBU class `B` and `C`. TNPCB is monitoring the following Chennai water ways viz., Adyar, Buckingham Canal, Coovum and Otteri Nullah to assess the level of pollution.

**Environmental Education:
Applied Research and Development:**

TNPCB has constituted an Applied Research and Development evaluation council to evaluate the research project proposals received from various research institutions, related to environmental pollution abatement. Funds for the above projects are released by the Board. So far (till 2004-05) nine such projects have been granted with Rs.45.38 lakhs. Three more proposals were recommended by the council to the board for financial assistance during the year 2005-06.

Environmental training:

Training on pollution abatement and prevention technique is provided to the industries, local bodies, NGOs and staff of the Board by TNPCB in the Environmental Training Institute established with the assistance from DANIDA.

Table - 11: Training imparted

| Year | No. of Programmes | % to total | No. of Participants | % to total |
|--|-------------------|--------------|---------------------|--------------|
| From 1995 – 2002 | 141 | 38.62 | 3739 | 24.31 |
| 2002 – 03 | 22 | 6.03 | 1978 | 12.86 |
| 2003-04 | 22 | 6.03 | 2229 | 14.49 |
| Till 31.2.2004 | 45 | 12.33 | 1818 | 11.82 |
| 2005-06 | 63 | 17.26 | 2854 | 18.55 |
| 2006-07 | 35 | 9.59 | 1819 | 11.82 |
| 2007-2008 | 37 | 10.14 | 946 | 6.15 |
| Total during 10th Plan | 187 | 51.24 | 10698 | 69.54 |
| Grand total | 365 | 100.0 | 15383 | 100.0 |

Source: Annual Report of TNPCB.

It is observed from the above table that nearly 51 per cent of the training programmes were conducted during the 10th Plan period and the number of participants attended the training programmes was around 70 per cent. The Board has proposed to conduct more and more training programmes with higher intake of participants in the coming years.

**Other activities:
Laboratories:**

TNPCB has established three Advanced Environmental Laboratories, 10 District Environmental Laboratories and one Mobile laboratory to collect and analyse the samples of effluents periodically.

Awareness Programmes:

Various environmental awareness campaign, workshops and rallies are conducted by the Board regularly. Special awareness campaign against air and noise pollution and theme based programmes on solid waste management and road safety, vehicular pollution, protection of ozone layer and rain water harvesting were conducted by the Board throughout Tamil Nadu.

Green Awards:

The Government of Tamil Nadu gives green awards every year to the District Collectors for their contribution to the promotion of environmental protection and sustainable development.

Environmental Atlas:

TNPCB in coordination with CPCB prepares 'Environment Atlas' for the districts of Tamil Nadu. So far the Environmental Atlas for Thiruvallur, Kancheepuram, Coimbatore, Vellore, Thoothukudi, Cuddalore, Villupuram, Erode, Salem and Karur districts have been prepared. The above work at Madurai, Trichy and Namakkal districts are under progress.

Plan Outlay for 2006-07 and 2007-08 :

During 2006-07 only 13.58 per cent of the funds were utilized. The revised estimate of 2007-08 shows that funds to the extent of 29.26 per cent was anticipated to be utilized by the environment sector.

Table – 12 : Plan Outlay for 2006-07 and 2007-08

(Rs. in lakhs)

| Sl. No. | Scheme | 2006-07 (BE) | 2006-07 (Accts.) | 2007-08 (BE) | 2007-08 (RE) |
|----------------|---|---------------------|-------------------------|---------------------|---------------------|
| 1. | Environment department | 90.66 | 96.46 | 166.56 | 178.09 |
| 2. | World Bank assisted scheme under Emergency Tsunami Reconstruction Project | 1095.24 | 64.87 | 1471.93 | 301.39 |
| | Total | 1185.90 | 161.03 | 1638.49 | 479.48 |

Source: Annual plan – Budget link – 2008-09

Schemes and Monitoring Activities Implemented during 2007-08:

Regular schemes such as National River Conservation Plan (NRCP), Chennai City River Conservation Projects (CCRCP), National Lake Conservation Programme (NLCP), National Green Corps (NGC), Environmental Awareness, Research and Development Programmes have been undertaken during 2007-08. Financial achievement of the above schemes are detailed below:

- An amount of Rs.22.44 crore has been spent towards the scheme of Abatement of pollution in five polluted stretches till 2007-08;

- A sum of Rs.27.79 crore was spent towards National River Conservation Programme during 2007-08 and thereby making the total commitment towards this project as Rs.439.04 crores;
- Towards Chennai City River Conservation Project, a sum of Rs.5.41 crore was spent during 2007-08;
- In addition to the above, following schemes were also proposed to be implemented during 2007-08;
- Preparation of Environmental Management Plan (EMP), an eco-city concept of developing towns into cities for the tourist town of Courtallam was proposed at a cost of Rs.10 lakhs; and
- Eco-restoration of Pavani water body at Pallavaram was proposed at a cost of Rs.10 lakhs.

World Bank assisted Schemes:

For better coordination among Project Consultants and the Government departments, one technical cell at Chennai and two project coordination units at Nagapattinam and Thoothukudi have been set up with World Bank assistance of Rs.53/- lakhs.

The following projects have been undertaken under the World Bank assisted Emerging Tsunami – Reconstruction projects during the year 2007-08.

- i. Demarcation of high tide line from pulicat lake to Palar river mouth has already been completed by the DOE. The remaining stretches of the coast line (from Palar to Thengapattinam) has been undertaken by the Remote Sensing Institute of Anna University, Chennai at a cost of Rs.2.21 crores;
- ii. Erection of stone pillars on HTL reference points at an interval of 250 meters along the coast is under progress at a cost of Rs.1 crore;
- iii. The Integrated Coastal Zone Management Plan and Coastal Vulnerability maps (ICZMP & CVM) are being prepared at a cost of Rs.4.92 crores; and
- iv. A sum of Rs.1 crore is about to be spent for the creation of awareness about ICZMP&CVM among the public through academicians and NGOs.

Global Warming – National and World Scenario:

Global warming, the most serious environmental problem is inextricably linked to the development and economic growth of any nation. It is the result of the increase in green house gases in the atmosphere which have lead and would lead to a warmer climate and adverse effects.

As per the Natural Resources Defence Council (NRDC) report, the global temperature has increased by one degree Fahrenheit over the last century mainly due to

the pollution of green house gases from power plants and automobiles and has trapped the heat in atmosphere.

The assessment report of the Intergovernmental Panel on Climate Change (IPCC) reports that the average temperature of the earth has increased during the 20th century to about 0.6 °C (+/-) 0.2 °C and states that under the existing scenario of economic growth and development, leading to green house gas emissions, on a world wide average temperature would rise by between 1.1 °C (1.98 F) and 6.4 °C (11.52 F) by the year 2100 and global mean sea level by at least 18 centimeters (7.2 inches).

The above effect is expected to increase the potential geographical range, more frequent and more intense heat waves, droughts and wild fires, virulence of tropical diseases, extinction of more than a million species and would disrupt the eco system.

It is the United States that undergoes the largest impact of global warming as it emits higher amount of Carbon dioxide (CO₂). According to the latest figures available, the United States produces 25 per cent of all CO₂ which is more than China (17%) and India (4.1%) together (21.1%), the highly populated countries. Whole of Europe emits - 17.2 per cent, Russia - 6 per cent, Japan - 4.7 per cent and Australia – 1.4 per cent. In 2003, extreme heat waves caused more than 20,000 deaths in Europe and more than 1500 deaths in India. The Arctic perennial polar ice cap is declining at the rate of 9 per cent per decade. In India, almost all the States of the Nation have experienced either 'above normal' or 'much above normal' average temperature in 2006.

International efforts had been taken from 1992 in the Earth Summit at Rio. Europe and Japan have imposed costs on themselves and their producers to reduce the emission of green house gases. The United States proposed a tax on carbon emission in 1993, but the alliance coal, oil and auto industries beat back this initiative. The pressure is increasing on the developing countries such as India, China and Brazil to adopt a more pro active role.

The Food and Agricultural Organization (FAO) has warned that India could lose upto 125 million tonnes of cereals and upto 18 per cent of Bangladesh could be under water by 2050. The Central government should give national priority to the problem of global warming. Companies should be encouraged to invest more in R & D for mitigating carbon emission. Documentation and analysis of our efforts in renewable energy, wasteland development and afforestation is needed. Robert N. Stains, Director of Environmental Economics Programme at Howard University has said that setting a real price on carbon emission is the right policy decision to combat emission. Use of exorbitant chemical fertilizers and pesticides should be replaced by natural resources and pesticides to the extent possible. Any serious attempt to cut emission would involve immediate costs, but the benefits may not appear for a long time. Developing countries generally argue that financial burden of change should be borne by developed countries, as they are more responsible for the current atmosphere change. India and China including other developing countries have demanded the rich countries to pay 0.5 – 1.0 per cent of their GDP to fight against climate change. The latest report by IPCC says that every human being should take action against global warming through changes in lifestyle and attitude.

Scenario of Tamil Nadu:

Ecological stability could be achieved by increasing the green cover. The draft 2nd master plan of the Chennai Metropolitan Development Authority (CMDA) offers direction on the greening project. A project to plant 35,000 trees in 6 Municipal Corporations in the State has been initiated at a cost of Rs.4 crores. The Forest Department along with the Municipal Corporations and other government agencies have decided to plant 45,000 saplings during this fiscal year. Adyar eco park is a globally bench marked ecotourism project implemented by a 50:50 joint venture Special purpose vehicle to be formed by the State and the Tamil Nadu Road Development company at a cost of Rs.100 crores. Research works are undertaken by the forest department in the area of afforestation. Several other initiatives such as use of compact florescent light bulbs, hybrid cars, use of clean and renewable energy sources such as solar, geothermal and wind power are taken by the government. As per the ENVIS report by the Department of Environment the highly polluted industries established within 1 km from rivers and reservoirs are banned from their operation since the industrial effluents affect the surface and ground water to a greater extent.

Environment friendly modern crematoria (Gasifier crematoria) will be established in 5 Municipal Corporations and 47 Municipalities in six months. As solid waste management is considered as a major tool for tackling climate change, some private agencies are involved in solving the mounting problem of garbage and creating awareness on environment related issues. Neal Metal Products Ltd., a subsidiary company of JBM Fanalca Environment Management Ltd. is involved in the segregation of garbage into bio-degradable and bio-non-degradable wastes in the 4 Corporation zones (Ice house, Adyar, Kodambakkam and Pulianthope). The Chennai Corporation will take the bio-degradable waste for a waste process management. The United States Educational Foundation in India and the East West Centre – Honolulu has formed an action group called Full Bright Environmental Action Group to create awareness of various environmental issues such as climate change and its implications, importance of safe drinking water in rural areas, eco-sanitation, harmful effects of over use of pesticides in agriculture and solid waste management in the region of South India. A detailed study on the impact of climate change in Tamil Nadu will be taken up either by the Energy Research Institute (or) Anna University (or) I.I.T. Madras at a cost of Rs.10/- lakhs during 2008-09.

Kyoto Protocol and Bali Road Map:

Kyoto protocol, an international agreement to fight global warming was adopted at the third conference of the parties to the United National Framework Convention on Climatic Change (UNFCCC) in **Kyoto, Japan in 1997** and was entered into force in 2005. While 175 countries have ratified the protocol, the United States which emits 25 percent of the Worlds' Green House Gases (GHGs) with 5 percent of the worlds' population has refused to ratify the protocol along with Australia. The protocol aims at reducing the GHG emissions below levels specified for each of them in the treaty within a short period of five years from 2008 to 2012. It is expected to reduce the emissions atleast by 5 percent against the baseline through the innovative mechanisms of

- Emission trading
- Joint implementation (JI): and
- Clean Development Mechanism (CDM).

These are the “market-based mechanisms” that allow developed parties (Annex I Parties) to earn and trade emissions credits (Kyoto protocol units) through projects implemented either in other than developed countries (or) in developing countries, to change the level of their allowed emissions over the commitment period (2008-2012).

Under **emission trading**, an annex I party may transfer Kyoto protocol units to acquire units from another Annex I Party within the Commitment Period Reserve (CPR). The CPR is the minimum level of units that a party must hold in its national registry at all times. **Joint implementation** is a joint mechanism by which an Annex I party can invest in another Annex I party and receive the credit through that project. **Clean development mechanism**, generates emission credits from projects in non-Annex I Parties (Developing countries).

With the implementation of the above mechanisms, a carbon market has been created and more and more business are making the investment decisions needed for a climate friendly future.

In order to come out with a consensus to overcome the problem of climate change during the post Kyoto period (post 2012) , an annual meeting of the UNFCCC was held in **Bali, Indonesia in December 2007**.The suggestions outlined by the Bali summit focused on two major axes viz. Negotiation tracks and Building blocks. Negotiation tracks referred to discussions on the long term future of the entire process. The summit also suggested to bring the reduction of emission from Deforestation and Degraded lands in Developing countries (REDD) under CDM/ carbon market mechanism. An observation by IPCC suggests that any action taken to limit the increase in average global temperature to less than 2⁰C above pre-industrial temperature by 2020 would require 25-40 per cent emission cuts below 1990 level.

Environment protection continues to be a growing crisis. Issues such as global warming, climate change, natural disaster, poor soil conditions, deforestation, water crisis, wider social and economic inequality and land inequality poses serious problems to sustainable development. Scientists are of the opinion that strategic decisions should be taken at the public policy level.