# STATE OF ENVIRONMENT REPORT TAMIL NADU - 2005



Department of Environment Government of Tamil Nadu Chennai

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Tel: 044 24331243, 044 24336421

Fax: 044 24336594 Email: tn@envis.nic.in

Websites: www.environment.tn.nic.in

www.tnenvis.nic.in

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Phone: 2855 2975

# **Project Coordinators**

# Thiru K.S. Neelakantan, I.F.S.,

Director

Thiru P.C. Tyagi, I.F.S.,

Additional Director

# **ENVIS and SoE Team**

Dr. C. Thomson Jacob

Senior Programme Officer

Mr. K.P. Raghuram

Programme Officer

Mr. J.D. Marcus Knight

Information Officer

SURJIT K CHAUDHARY, I.A.S., SECRETARY TO GOVERNMENT

**Environment & Forest Dept., Secretariat,** 

Chennai - 600 009.

PHONE: 25671511 (O)

24874311 (R)

FAX: 25670560

**Foreword** 

A good environmental sense has been one of the fundamental features of India's ancient philosophy. The survival and well being of a nation depend on sustainable development. It is a process of social and economic betterment that satisfies the needs and values of all interest groups without foreclosing future options. To this end, we must ensure that the demand on the environment from which we derive our sustenance, does not

exceed its carrying capacity for the present as well as future generations.

There is an awakening the world over to have a clean and healthy environment. Environment is influenced by a variety of factors; the multiplicity factors make environmental management a complex issue. To formulate an appropriate policy for environmental management and to implement the programme, a base line or

benchmark survey the present status of various factors that govern the environment is a pre requisite.

The State of Environment (SoE) Report provides a general picture of the state of the biophysical and socioeconomic condition and an understanding of how human activities affect the environmental conditions and it's implications on human health and economic well being. It also provides an overview of the outcome responses such as policy initiatives, legislative reform and changes in policy behaviour. The SoE Report has a

large pool of potential users for both the monitoring and reporting functions of the system.

I congratulate the Department of Environment, Government of Tamil Nadu for bringing out the Report. This is the first time such a comprehensive report has been compiled in the state and it is my sincere wish that the Report will be a benchmark for sound environmental planning in future for conserving the environmental resources of Tamil Nadu.

515/02

Surjit K. Chaudhary, I.A.S., Secretary to Government Environment and Forests Department Government of Tamil Nadu Chennai 600 009 Preface

One of the greatest challenges India has to face over the next few decades is how to accelerate

economic growth without exhausting the resources on which the growth depends, and at the same time

provide social security to its diverse population. Environmental health is of utmost importance to India's

future especially because approximately 60 per cent of the population continues to live in rural and peri-urban

areas. Good soil is critical, to provide the ever-increasing population with food, fodder for livestock, as well

as income from sale of produce. Forests support water retention in river catchments, provide fuel for cooking

and heating, and supply fodder to livestock.

The State of Tamil Nadu has made remarkable strides especially in the areas of health and

education. Over the last few decades, the State Government has carried out land reform, mandated

education, focussed on primary health care and implemented some of the most successful maternity

and child nutrition schemes. The results are impressive: a decline in birth rates, and also infant and

maternal mortality rates. Tamil Nadu is also one of the most urbanised states of the country. We are

today in a state where similar successful initiatives need to be developed and implemented for

protecting our environment.

The State of Environment Report in many ways marks the beginning of a new phase of environmental

protection in Tamil Nadu. I am sure the SoE Report, brought out through the pioneering effort of DoE will be

useful to all the departments of the Government, researchers and students.

I welcome comments and suggestions for improving the report further. It is proposed to update and

publish this report biannually with the financial support of Government of India.

K. S. Neelakantan, I. F. S.,

Directo

Department of Environment

Government of Tamil Nadu

Chennai 600 015

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**Acknowledgements** 

The State of Environment Report of Tamil Nadu provides the general profile of the State's biophysical

and socio-economic conditions, policy initiatives, legislative reforms of the State. This report was prepared

based on a framework suggested by Government of India with inputs from various organisations. This report

is an outcome of the effort and co-operation from several people and Government Departments.

I wish to acknowledge the technical and financial assistance extended by the Ministry of Environment

and Forests, Government of India for the preparation of SoE report 2005.

My gratefulness is due to Smt. Gayathri Ramachandran, I.A.S., Director General, and her colleagues

from the host institute, EPTRI, Hyderabad for assistance and guidance in preparing this report in DPSIR

format.

My gratitude is also due to Dr. S. Balaji, I.F.S., Former Director, Department of Environment and

Mr. Ashish Kumar Srivastava, I.F.S., Former Joint Director, Department of Environment for their efforts to

interact with experts to bring out the issues to be addressed in this report.

I warmly appreciate the cooperation rendered by Thiru P.C. Tyagi, I.F.S., Additional Director, staff of

ENVIS Centre, Dr. C. Thomson Jacob, Mr. J.D. Marcus Knight, Mr. K. Gopinath and Ms. T. Indra Devi and

Mr. K.P. Raghuram, SoE Cell for collecting, collating and analysing scientific information from various

sources and compiling this report in the present form.

My appreciation and acknowledgement are due to Tamilnadu Pollution Control Board, Tamil Nadu

Forest Department, Environment Management Agency of Tamil Nadu, Public Works Department,

Groundwater Department, Evaluation and Applied Research Department, M.S. Swaminathan Research

Foundation, Madras School of Economics and Care Earth, for providing valuable data and information for

the preparation of this report.

Above all I would like to place on record the efforts of all the personnel of the Department of

Environment.

K. S. Neelakantan, I. F. S.,

Director

Department of Environment

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### **Process Documentation**

The State of Environment Report (SoE) is intended to provide a benchmark for future environmental reporting and also serve as the database for the policy making for the preparation of Environmental Management Plans. SoE Report discusses viable policy initiatives, legislative reforms required for economic well being. The regular SoE Reporting ensures access to upto date and scientifically accurate information about the environment to all the stakeholders, public, industry, NGO and all levels of Government agencies. During the Tenth Five Year Plan, the Ministry of Environment and Forests, Government of India proposed a scheme for assisting the State Governments and Union Territories to develop and disseminate State of the Environment Reports on a biannual basis.

#### **National Host Institution (NHI)**

The Environment Protection Training and Research Institute (EPTRI) Hyderabad was designated as the National Host Institution by MoEF to provide necessary technical assistance for the State Governments in the preparation of SoE Reports.

### **National Steering Committee**

The NHI is supported by the National Steering Committee which includes experts from different States, representing various institutions, academic institutions and NGOs. The Joint Secretary MoEF, is the Chairman of the National Steering Committee.

#### **State Host Institution (SHI)**

For the State of Tamil Nadu, the Department of Environment, Government of Tamil Nadu, has been designated as the Nodal Agency. It was mandated that the Report to be developed using a participatory process and keeping with this overall mandate, the SoE Report for Tamil Nadu was developed using a multi-layered participatory process. Two overlapping strategies were utilised for enabling the effective participation of departments, Non-Governmental Organisation and the public. A State Level Advisory Committee (SLAC), chaired by the Secretary, Environment and Forests and the nodal officer from each department were appointed to review this report and provide guidance through periodic meetings. District and regional level meetings were conducted under the chairmanship of the District Collectors in various districts to get first hand information on the local environmental issues.

### Methodology DPSIR Analysis

In this background, compilation of the present report was taken up by adopting the Driving force, Pressure, State, Impacts and Response (DPSIR) methodology, now internationally recognised for describing the state of environment and facilitating an overall integrated environmental assessment. Under pressures underlying causes for the change of environment i.e. diminution or accretion to natural resources like land and soil, water, air, vegetation and fauna are examined. The actual state of the natural resources, both in terms of quantitative availability and qualitative change, is discussed subsequently.

# **Summary and Challenges**

The State of the Environment (SoE) report of Tamil Nadu provides the general profile of the state's bio-physical and socio-economic conditions; analyses the role of anthropogenic factors in environmental management and highlights the implications of unsustainable actions on human health and economic well being. It also provides an overview of outcome responses of the State such as policy initiatives, legislative reform and changes in policy behavior. The objectives of the report are to increase the awareness and understanding of environmental trends and conditions, to provide a foundation for improved decisionmaking at all levels, and to facilitate the measurement of progress towards sustainability. The SoE report has been prepared for Tamil Nadu addressing economic and social development. The major environmental issues reported in this report are pollution, urbanization, biodiversity and waste management. The report on priority issue was prepared following the DPSIR (Driving force-pressure-state-impact-response) frame work.

#### **Demography**

Tamil Nadu is the sixth most populous State. The Census 2001 results shows that the population of Tamil Nadu is 62.1 million comprising of 31.3 million male and 30.8 million females. According to the Tamil Nadu Human Development report, the death rate in Tamil Nadu has declined by about 30 percent and made significant contribution in terms of poverty reduction. Tamil Nadu fares better in Human Development Index (HDI). The HDI is a composite index of three dimensions economics, education and health. In comparison with other major states, Tamil Nadu is at the top. If the per capita income goes up, Tamil Nadu is likely to do even better on HDI. Since urban areas have a higher HDI than rural areas, the high level of

urbanization of Tamil Nadu is an advantage in terms of human development. The literacy rate of the State has been progressively increasing over the years. As per the 2001 Census, the literacy rate stands at 73.47 per cent, next only to Kerala and Maharashtra and far higher than the All India level 65.38 per cent.

### **Agriculture**

Agriculture continues to be the prime mover of the state economy supporting 62 percent of the population and contributing 13 percent of the state income. The Government is aiming to achieve 100% food security in the State and also to create avenue for export of agricultural produce for economic upliftment of the farming community. During the tenth plan period, the State is aiming an annual growth rate of 4% in agriculture and 8% in horticulture crops for sustainable agricultural development, employment generation and poverty alleviation. The Government is focusing its policies towards overall development of agriculture sector in terms of increasing the cropping intensity by bringing every piece of land under cultivation, productivity increase, maximizing natural resources with parallel efforts to conserve them. The agricultural sector relies on improved crop varieties, fertilizers and pesticides to increase production. Indiscriminate use of chemical fertilizers has not only affected the soil structure but has also polluted the surface and ground water. Chemical fertilizers can be supplemented with bio-fertilizers and vermicompost can sustain crop without further deteriorating soil health. An integrated nutrient and pest Management programme needs to be implemented to ensure optimal yield. Pest resistant crops and permaculture could be introduced for ecological farming.

#### Forest and wild life

Tamil Nadu is the southern most state of India. The total geographical area of Tamil Nadu is 1,30,058 sq.kms, of which the recorded forest area is 22,877 sq.kms, which constitute 17.59% sq.kms of the States geographical area. In order to protect and conserve the rich biodiversity in the State, a network of Protected Areas has been constituted comprising 5 National Parks, 20 Wildlife Sanctuaries and two Biosphere Reserves. In order to achieve these targets, various schemes and programmes of Government are aimed at restoring the degraded forests and expanding forests outside the Protected Area system. To conserve the existing forest cover, Joint Forest Management approach is being extended to all degraded forest areas and better protection is accorded. Further, to increase tree cover outside the forest area, Integrated Wasteland Development programme which aims at bringing 37 lakh ha. of wasteland under tree cover is actively being pursued as part of the Forest Development Fund programme.

#### **Biodiversity**

Tamil Nadu is endowed with a rich biodiversity. The main natural habitat types are Forest, Mountains, Rivers, Wetlands, Mangroves and Beaches. Tamil Nadu shares the Western Ghats (one of the 25 biodiversity hotspots) with the states of Kerala, Karnataka, Goa, Maharashtra and Gujarat. It shares the Eastern Ghats with the States of Andhra Pradesh and Orissa. To conserve the biodiversity a National Biodiversity Authority has been set up at Chennai under the Biological Diversity Act 2002 to deal with any matter concerning conservation of Biological Diversity, its sustainable use and fair and equitable sharing of benefits arising out of the use of Biological resources and associated knowledge.

#### **Archaeology and Tourism**

Tamil Nadu, with its picturesque hills, beaches, waterfalls, wildlife sanctuaries, temples, ancient

monuments, places of worship for all faiths and centres of art and culture, has lot to offer to domestic and international tourists. There has been a steady increase of domestic and international tourist inflow into the state. The state of Tamil Nadu has a great potential for the development of eco-tourism initiatives, especially in view of its cultural and natural diversity. Eco-tourism is considered one of the most viable tools to enable economic growth and ecological security. One of the key points of eco-tourism is that smaller players like local residents; tribal groups etc get to participate and benefit from the programme. Ecotourism is a sustainable form of natural resource-based tourism which focuses on experiencing and learning about nature. It is ethically managed so that minimal impact is caused on the immediate environment.

UNESCO has identified two World Heritage Sites in Tamil Nadu namely the Mahabalipuram monuments and Brahadeeswara temple at Thanjavur. These two sites have been taken up for preservation by Archaeological Survey of India. In addition to these two sites, the ASI has also taken up other important sites and monuments for preservation.

#### Water Resources

There are 17 river basins in Tamil Nadu of which the Cauvery is the largest. Most of the surface water is harnessed in 61 major reservoirs and about 39,000 tanks, 60 per cent of the ground water has also been put to use. The estimated demand already exceeds the availability in most of the river basins of the State. There are also serious water quality problems in some of the basins due to industrial pollution. Sea water intrusion is also occurring along the coast due to the over extraction of groundwater. The major contributors to industrial pollution are leather tanning units, textile processing units, chemical and petrochemical industries, cement industries and thermal power plants.

Leather industry creates high incidence of pollution affecting the water quality. In addition to the leather industry, textiles, dying, hotels and lodges are also bound to generate adverse externality. For coping with the incidence of pollution of varying proportion, the Tamil Nadu Pollution Board has established 33 Common Effluent Plants in different places.

In many places, surface river water is not suitable for domestic use and hence efforts have been made to recharge ground water through mandatory rainwater harvesting in all Corporations, Municipalities and Town Panchayats. Conserving rainwater in temple and village tanks, construction of check dams and efficient irrigation through drip or sprinkler irrigation in river basins can lead to enhanced water conservation. Taking up massive afforestation works in the catchment areas of major reservoirs to avoid sedimentation and riverbank plantations of teak and bamboo may also be encouraged in this regard. Farmers should also be educated about the danger of over exploitation of ground water.

The Department of Environment is taking steps in the abatement of pollution in the most polluted stretches of the rivers Cauvery, Vaigai and Tamiraparani by providing underground sewerage and Sewage Treatment Plants besides providing sanitation and solid waste management facilities under the National River Conservation Plan (NRCP). Chennai City waterways are being cleaned up under Chennai City River Conservation Plan. Abatement of pollution in Ooty and Kodaikanal lakes have been undertaken for ecorestoration.

#### **Coastal and Marine Environment**

Tamil Nadu has a long coastline of 1076 kms. The coastal area of the State is thus a major natural resource with immense value for commercial, recreational and aesthetic purposes. The rich coastal habitats are being threatened by pollution especially from land based sources, development projects such as ports, dams, tourism, deforestation, natural disasters, over fishing and destructive fishing practices. Expansion of human activities and settlements has also led to excessive withdrawal of groundwater in the fragile coastal belt and many parts of the coastline are being threatened by salinity intrusion.

Pollution of coastal water through dumping of raw sewage, garbage, industrial effluents, pesticides, thermal pollution, and residues has resulted in depletion of fishery resources and this is a major environmental concern for Tamil Nadu. It is being suggested that local bodies should develop suitable mechanisms for collection and treatment of raw sewage, solid waste, etc., that enter the sea to prevent sea water pollution. The active and unrestricted mushrooming of aquaculture units along the coast, and the over exploitation of marine resources are other major concerns. For conserving the coastal environment Tamil Nadu State Coastal Zone Management Authority (SCZMA) was constituted by the Ministry of Environment and Forest, Government of India in 1998. The authority will process environmental clearance under CRZ Notification 1991. A green squad for conserving the coastal environment has been formed to monitor CRZ violations.

#### **Industrialisation**

Tamil Nadu is at the top in terms of number of factories. It ranked second in providing employment and third in fixed and productive capital, gross value of output and net value added by contributing towards national income. Tamil Nadu was the second largest software exporter in the country next only to Karnataka sharing 13.72 per cent in 2004-05. Due to the liberalized policy, the pace of industrialization has been accelerated, which has also resulted in increasing amount of hazardous wastes every year. This along with a growing amount of municipal solid waste and hospital waste due to rapid urbanization continues to remain a daunting issue of environmental concerns.

Tamil Nadu have started moving towards cleaner technologies such as adoption of membrane cell instead of mercury cell in caustic soda manufacturing, adopting of dry process instead of wet process in cement production, adoption of double conversion and double absorptiontechnology in sulphuric acid manufacturing, gas carburizing instead of cyanide salts in heat treatment and cyanide free electroplating. Pulp and paper industries are

being encouraged to go in for elemental chlorine free bleaching to reduce the formation of organo-chlorides including dioxins. Industries consuming ozone depleting substances are systematically changing to environment friendly compounds.

#### Urbanisation

Tamil Nadu ranks first in urbanisation among the fifteen major states in the country. This has led to the deterioration of quality of life in urban areas. Strict enforcement of town planning rules and strengthening of urban local bodies is needed to ensure availability of basic services such as drinking water, sanitation and solid waste management. In Tamil Nadu, out of 744 towns (including corporations and municipalities), 145 towns are not fully provided with water supply. In Tamil Nadu underground drainage system has been provided only in major urban centres, like Salem, the municipal corporations of Chennai, Coimbatore, Tiruchirapalli, Tirunelveli and Madurai. During the year 2004-05 a policy decision was taken to provide under ground sewerage scheme in the remaining 22 district head quarters towns. The high influx of population to urban areas, increase in consumption patterns and unplanned urban

and industrial development have led to the problem of air pollution. The larger industries have a very high aggregate pollution potential.

Sustainable development is to achieve the needs of the present generation without compromising the ability of the future generation to derive benefits from our natural resources. The State of the Environment Report, Tamil Nadu has attempted to broadly outline the environmental issues in various sectors and possible approaches to tackle them. Optimum utilisation of land resources, sustainable agricultural production, forest restoration and greening for better quality of life, conservation of rich biodiversity and scarce water resources, abatement of land, water and air pollution are some of the management issues which need immediate attention.

Economic development cannot be considered in isolation. The four 'E's, Ecology, Energy, Economics and Equity are intertwined. If energy consumption is considered as a parameter for economic development, environmental ethics with inter-generational equity is the key to sustainable socio economic development. The State of the Environment Report, Tamil Nadu is the first step towards such an endeavor.

## Introduction

The last few decades have witnessed a global awakening to have a clean and healthy environment and also ensure that the future generation is assured of the same. Environment is influenced by a variety of factors; and it is this multiplicity that makes environmental management a complex issue. The formulation of an appropriate environment management policy and the consequent implementation of its programme components therefore need to be based on sound scientific and management principles. One of the prerequisites for such an endeavor is the base line or benchmark survey of the present status of various factors that govern the environment.

The governing principle in the development strategy is growth with sustainability. Environmental degradation is one of the concomitants of economic development so that the State has to trade off one against the other. There are ten drivers of global environmental deterioration - population growth; affluence of some; poverty of many; environmentally unfriendly technology; market failure to price goods like air, water and land; policy failure to correct such price distortions; scale and rate of economic growth; the nature of growth; consumerist culture and values and globalisation. Environmental degradation impacts soil fertility, quality and quantity of fresh water, air quality, forests and fisheries, climate change, stratospheric ozone depletion and biodiversity loss. All forms of life - human, animal and plant - are closely interlinked and that disturbance in one gives rise to an imbalance in others. In our constitutional provisions and environmental legislation and planning objectives, conscious efforts have been made for maintaining environmental security along with developmental advances.

Tamil Nadu is the southern most state in the Indian subcontinent. It lies between latitude 8° 04' and 13° 34' N and longitude 76° 14' and 80° 21' E. Tamil Nadu, with an estimated area of 1,30,058 sq.km, ranks eleventh among the states of India in size and constitutes 4 per cent of the land

area of the country. The State can be divided into two broad natural regions, the coastal plains and hilly western area. The major rivers flowing through Tamil Nadu are the Cauvery, Vaigai and the Tamiraparani. Tamil Nadu has a population of 62.1 million in 2001 making it the sixth most populous State in the country. The density of population in Tamil Nadu is 478 persons per sq.km.

Tamil Nadu fares better in human development index (HDI), in comparison with other major states. Tamil Nadu is second only to Kerala among the major states in most indicators of human development as well as the HDI. The literacy rate of the State has been progressively increasing over the years; the literacy rate stands at 73.47 per cent, next only to Kerala and Maharashtra.

Agriculture provides basic sustenance to all living beings. It is very important that ecologically, socially and economically sustainable agriculture should become the backbone of the development process of the State. Agriculture continues to be the prime mover of the State economy supporting 62 percent of the population and contributing 13 percent of the State income.

Tamil Nadu is endowed with a rich biodiversity. The main natural habitat types are Forest, Mountains, Rivers, Wetlands, Mangroves and Beaches. Tamil Nadu shares the Western Ghats; one of the 25 biodiversity hotspots and the Eastern Ghats with the neighboring States. In order to protect and conserve the rich biodiversity in the State, a network of Protected areas has been constituted comprising 5 National Parks, 20 Wildlife Sanctuaries and two Biosphere Reserves. Tamil Nadu has a great potential for the development of ecotourism initiatives, especially in view of its cultural and natural diversity. Eco-tourism is considered one of the most viable tools to enable economic growth and ecological security.

There are 17 river basins in Tamil Nadu. The estimated water demand exceeds the availability in most of the river basins of the State. There are also serious water quality problems in some of the basins due to industrial pollution. In Chennai particularly, the waterways are severely polluted due to the discharge of domestic wastes. Sea water intrusion is also occurring along the coast due to the over extraction of groundwater. Tamil Nadu has a long coast line of 1076 kms, which constitutes 15% of the total coastal length of India. The Tamil Nadu Coastal areas in the State are home to some of the richest, most diverse and fragile natural resources.

Tamil Nadu ranks first in the country in terms of wind power generation. Tami Nadu has played a prominent role in promoting and harnessing these sources especially wind and biomass including biogas. To encourage the use of alternative sources of energy and various renewable sources of energy, the Tamil Nadu Energy Development Agency (TEDA), has been playing a catalytic role.

Tamil Nadu is at the top in terms of number of factories. Of particular concern are tanneries which are located in Vellore, Kancheepuram, Dindigul and Erode districts. The effluents have caused serious problems in the Palar basin. Similarly, there are a large number of textile bleaching and dyeing units in Tiruppur, Erode, and Karur, which have contaminated the Noyyal, Amaravathy and other water bodies.

Tamil Nadu has emerged as the State with the highest level of urbanisation is related to the emergence of a large number of statutory towns. The high influx of population to urban areas, increase in consumption patterns and unplanned urban and industrial development has led to the problem of air pollution. Due to the liberalized policy, the pace of industrialization has been accelerated, which has resulted in increasing amount of hazardous wastes every year. This along with a growing amount of municipal solid waste and hospital waste due to rapid urbanization continues to remain a daunting issue of environmental concerns.

#### Frame work of the report

The report documents the present status of key sectors that are concerned with the environment; and the issues that impact these sectors. The sectors have been presented as eight distinct sections that follow a uniform style of presentation containing a general description, past trends, current activities, policies and schemes in existence and plans for future. These sectors are agriculture and horticulture, forests and wildlife, water resources, coastal and marine environment, energy, industrialization, urbanization and archaeology and tourism.

The eight sectors have been grouped and presented using four thematic colours for the sake of convenient reference and use. The colour green has been conventionally used to denote vegetation, and hence has been used here to represent agriculture, forests and wildlife, biodiversity and archaeology and tourism. Blue has been used to symbolise coastal and marine environment and water resources, while the colour brown relates to human concerns like industrialization, air and water pollution and waste management. The more recent human concerns (ie.) energy, urbanization and demography are depicted using purple colour. Four cross-cutting issues viz. demography, air and water pollution biodiversity and waste management have been identified and detailed in the report. Wherever applicable and possible, the issues have been analysed using the DPSIR (Driving Force, Pressure, State, Impact and Response) framework that was suggested by Ministry of Environment and Forests, to understand the current status, driving forces, pressure, legal, policy and programme response and the gaps in knowledge. The overlap that exists amongst the issues is indicative of the synergistic potential that can be tapped for environmental protection and conservation.

It is proposed to widely disseminate the report not only to provide relevant information to the concerned departments and public, but also seek suggestions for improvement. The State of Environment Report 2005 represents the first step in the formulation of the Environmental Management Plan for Tamil Nadu.