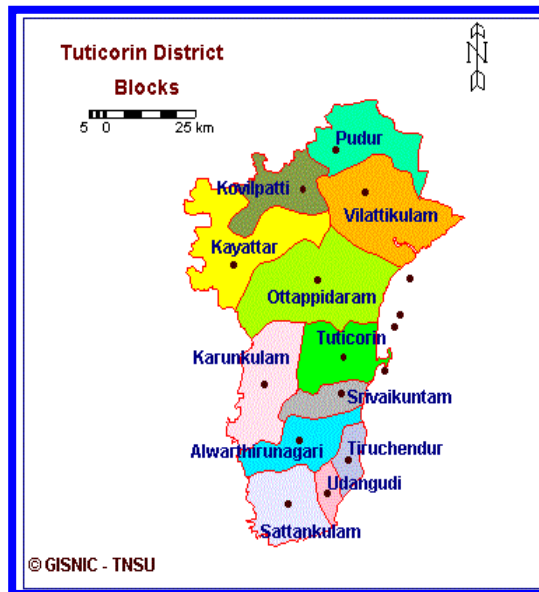
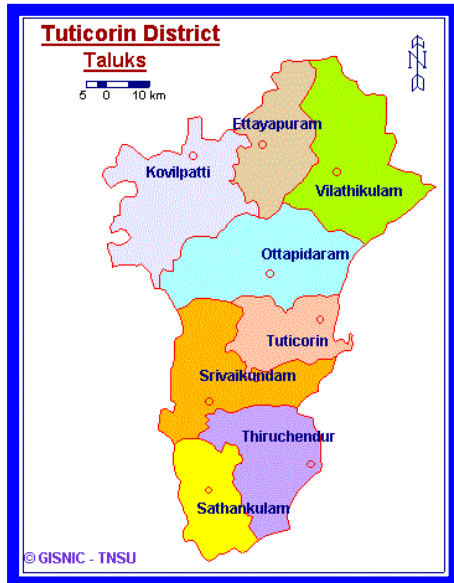


## Environment profile for Thoothukudi district



### 1

## The context

The Department of Environment (DoE) is the nodal department for dealing with environmental management of the State. The State has been endowed with multitude of natural resources, judicious management, which is essential for sustainable development in all sectors. An effective management of resources calls for an in-depth assessment of their existing conditions and trends. A cursory evaluation of the present status of our environment and natural resources including land, soil, water and air, and the life support systems like forests, rivers and coastal areas indicates that the health of such systems is threatened by serious levels of degradation. Though different Government Departments / Agencies are responsible for management of resources under their jurisdiction, information relating to the individual sector lies fragmented.

To manage the environment in a holistic manner and to develop the environment friendly sustainable development perspective, it becomes necessary to identify the gaps in the present management of resource bases. Such intervention would be realistic only when the data collected from the primary/secondary sources is compiled and presented in the form of district environment profiles, to provide a strong database. Thus, AIMS Research (A Joint Venture of TCW/ICICI, IDBI and ICICI) – one of the leading consultancy and research organisation, has been engaged in the preparation of such a report. This report would form the basis for developing environmental management plans at district levels and this would spell out specific action programs to be implemented by local / state institutions. This report provides a brief account of the manner in which the District has been prepared and presented.

To achieve certain degree of uniformity in the presentation of environmental data in the districts, it is considered necessary that certain standardised formats are adopted for collection and presentation of the relevant data besides interpretation of the data thus collected. Accordingly the data compiled in the prescribed formats have been synthesised and presented in the following chapters.





# 2

## Background

The district of Thoothukudi was carved out as a separate district in the year 1986 as a result of bifurcation of Thirunelveli district of Tamilnadu State vide State Government notification, Go. Ms. No.11314 dated 27.9.86. According to the said notification seven taluks viz. Kovilpatti, Vilathikulam, Ottapidaram, Thoothukudi, Srivaikuntam, Thiruchendur and Sattankulam were transferred to newly formed Thoothukudi district. There seven taluks have been divided into twelve community development blocks.

### 2.1 Geographical location of the district

The district of Thoothukudi, extending over an area of 4590.54 sq.km, is situated in the south portion of the State of Tamilnadu. The Bay of Bengal bound it on the north and south and on the west by Thirunelveli district. The administrative headquarter is located at Thoothukudi town. Tamirabarani river and Manimutharu river are flowing in the district and they will dry during the summer season.

The district lies between 8° 32' and 9° 37' north latitude and 77° 72' and 78° 36' east longitude.

## 2.2 Administrative arrangement in the district

Thoothukudi district comprises of 7 taluks and 12 blocks. As regards to the hierarchy of administrative arrangement, there are 2 municipalities, 20 town panchayats, 408 village panchayats and 445 villages in the district. The details of villages are not available. The details regarding the number of blocks, villages, village panchayats, town panchayats and municipalities with regard to each taluk are given in table no: 1.

## 2.3 Meteorological information

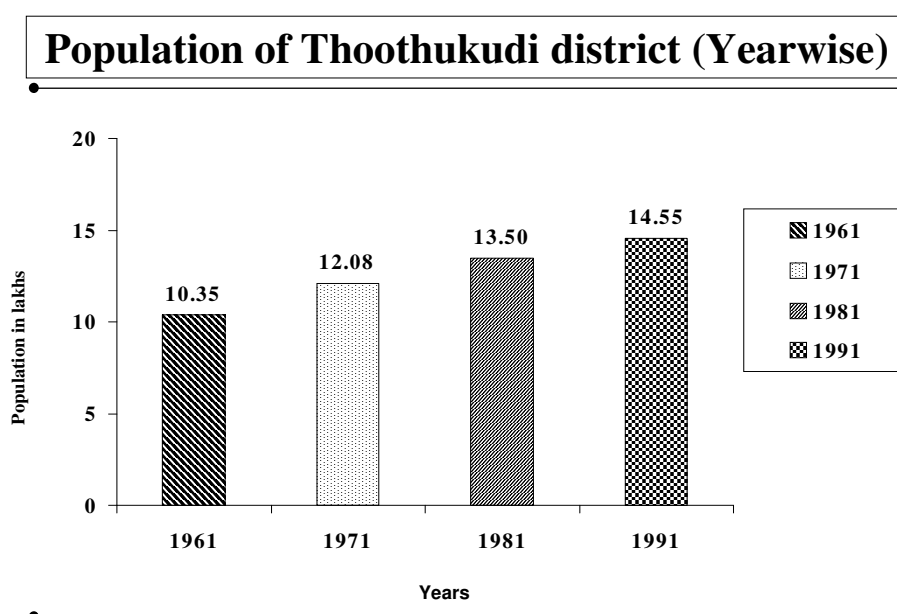
The monthly average rainfall in the district was 55.18 mm during 1997-98 period. During the months of October, November and December, the district receives a rainfall, which is more than the annual average rainfall. The average mean maximum and minimum temperatures for the district have been 31.40° C and 24.30° C respectively. The average number of rainy days, mean maximum and minimum temperatures and mean relative humidity for the period of 1997-98 are given in the table 2.

## 2.4 Demographic details

The growth of population over the past four decades and the essential characteristics of the population in terms of birth rate, death rate, infant mortality rate and literacy level are given in the table no.3, table no. 4 and table no. 5.

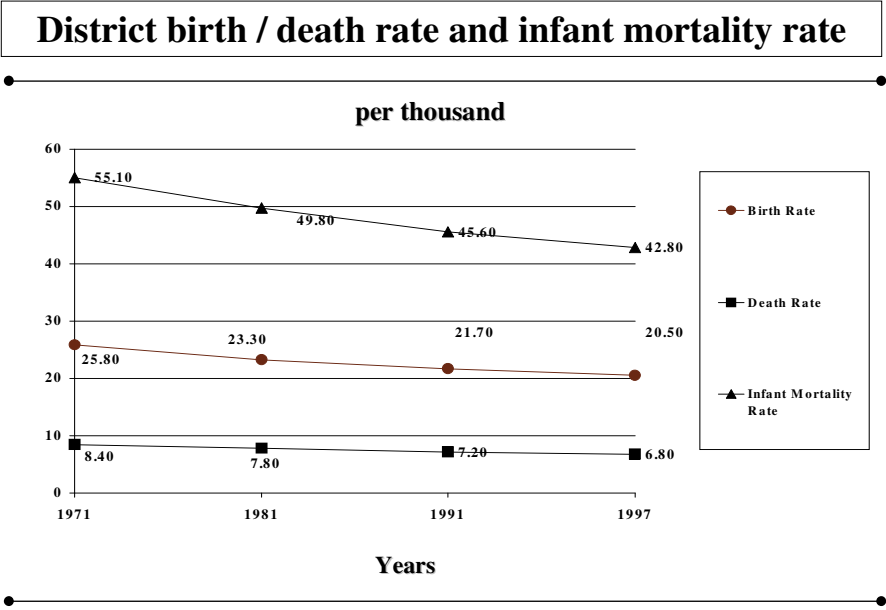
### 2.4.1 Population

The population of Thoothukudi district was 14.55 lakhs in 1991 with a growth rate of 7.8% during 1981-91 period. According to the 1991 census, Thoothukudi taluk was the most thickly populated while Sathankulam taluk was least populated, in the district. The details of population growth along with the growth rates (talukwise) are given in table no.3.



### 2.4.2 Trend in birth/death rate and infant mortality rate

Birth rate, death rate and infant mortality rate have been reduced significantly from 25.8 in 1951 to 20.5 in 1997, 8.4 in 1951 to 6.8 in 1991 and 55.1 in 1951 to 42.8 in 1997 respectively. The details regarding these are given in the table 4

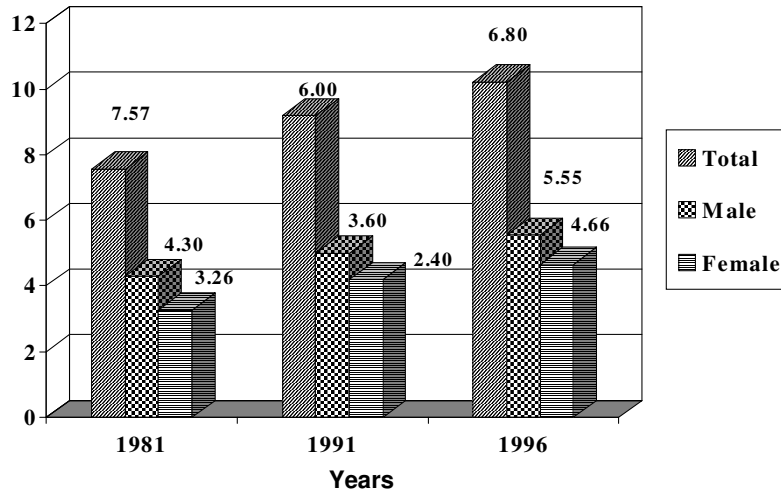


### 2.4.3 Literacy level among the population

The literacy level of Thoothukudi district according to figures available for the year 1996 is 63.83% with the male literacy level being more than that of the female literacy level. It is also observed while the male literacy level has grown steadily from 65.57% in 1981 to 71.20% in 1996, there has been a significant increase in the female literacy level also from 47.11% in 1981 to 56.81% in 1996. The detail of literacy level of the district is given in table no: 5.

## Literate Population of Thoothukudi district

in lakhs





## 3

### Resources-availability, use and environmental status

#### 3.1 Land resources

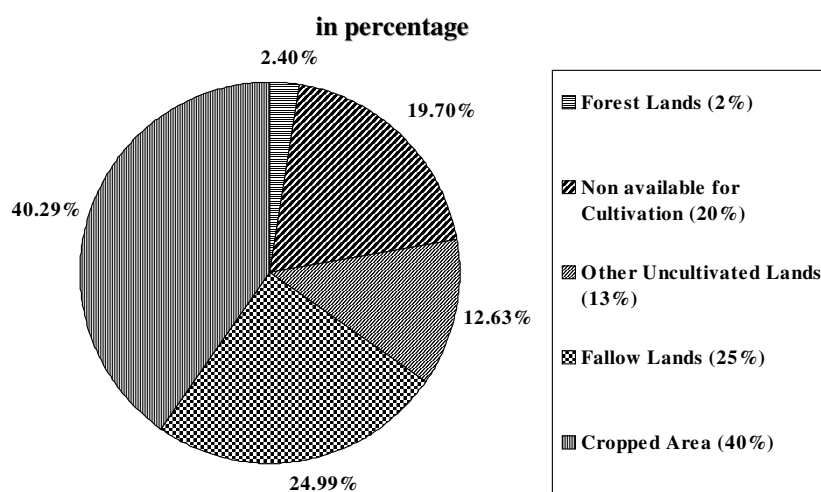
Resources of the district, their availability, use and environmental status is discussed in the following chapters.

##### 3.1.1 Agriculture and horticulture

###### *i. Land utilisation*

The total geographical area of the district is 4590.54 sq.km in 1995-96. Cropped area accounts for about 40.29% of the total area. Forestlands cover about 2.40% of the total land. A significant portion (19.70%) of the land falls under the category of 'non available for cultivation' and 24.99% under 'fallow lands'. About 12.63% fall under the category of uncultivated land. The land utilisation pattern in Thoothukudi district is given in table no: 6.

### Land utilisation - Thoothukudi district



#### ii. *Trend in production and productivity of important crops*

Cereals, pulses and oil seeds are the three important crops produced in the district. The productivity pattern indicates that the productivity of pulses and oil seeds has fluctuated and of cereals has increased for the past 5 years. The area under production of pulses and oil seeds has fluctuated during 1990-97 period, but the area under production of pulses has slightly increased in the same period. The details regarding the productivity performance of the district in relation to the above important crops for the past 5 years are given in table no: 7.

#### iii. *Horticultural and plantation crops*

There was a yield of 3,70,740 tonnes of fruits, vegetable crops with a yield of 1,65,800 tonnes and plantation crops with a yield of 720 tonnes during the year of 1995-96. The details pertaining to the crops are given in table no.8.

*iv. Consumption of fertilisers and pesticides*

The consumption of chemical fertilisers was 13813 metric tonnes in 1995-96, out of which more than a half constitutes the nitrogenous fertilisers. There was an intensive use of urea 7600 metric tonnes in Thoothukudi district and use of bio-fertilisers was (1,70,000 pockets) followed by dust pesticides 49000 kgs and liquid pesticides 5400 litres in 1995-96 period. The details on consumption of fertilisers and pesticides are given in table no. 9.

*v. Trend in consumption of fertilisers and pesticides*

The consumption of chemical fertilisers was 21,413 tonnes and bio-fertilisers were 1,70,000 pockets followed by pesticides of dust and liquid are 49,000 kg and 5,400 liters respectively (Refer table no: 10) in the year 1995-1996.

*vi. Soil types*

Sandy coastal alluvium (27.37%) is the predominant soil type followed by red loam (20.96%). Black soil (13.49%) is the other type of soil prevalent in the district. The soil distribution pattern is given in table no: 11.

*vii. Soil problems*

About 5% of the land available for cultivation suffer from degradation and 0.001% of the land is water logged and marshy. The details in this regard are given in table no: 12.

*viii. Status of soil and water conservation programmes*

29,564 wells for irrigation and 26 check dams/stop dams were constructed in Thoothukudi district in 1995 - 1996. Soil conservation works were being undertaken in 2000 hectares of cropping area. The necessary details in this regard are given in table no: 13.

3.1.2 Forest resources

*i. Forest area*

The forest areas under legal classification and under green cover classification constitute a total area of 13358.04 hectares (133.58 sq.km). The reserve forest categories extend over 10817.68 hectares (108.17 sq.km) and land under green cover classification spread to 134633 hectares (1346.33 sq.km) in the composite Thirunelveli district. There is an area of 44565 ha. under dense forests, 39181 ha. of sparse forests, 20860 ha. of degraded forests and 4726 ha. of grass lands in Thoothukudi district. The details regarding the classification of forest area with their extent are given in table no.14a & 14b.

*ii. Trend in per capita forest area*

There was 13358.04 hectares of forest area in the period

between years 1961 - 1996. There is a decreasing trend in the percapita forest area to the increase in population. The details are given in table no: 15.

*iii. Man made forest plantations*

The information is not available to the consultants from the concerned department (Refer table no.16).

*iv. Details of villages abutting forest area*

Four taluks located in Srivaikundam, Thiruchendur, Ottapidaram, Kovilpatti, which are abutting forest area in the district. There are seven revenue villages of abutting forest area, namely, Vallanad, Mullakad, Kudiraimozhitheri, Chalikulam, Kurumalai and Sathankulam. (Refer table no: 17).

*v. Trends in production of forest produce*

Timber production in reserve forest area at 1297 tonnes during the year 1996 and fuel wood production of 24 tonnes in the district. Other details are not available in the district (Refer Table No.18).

*vi. Tribal villages*

There is no tribal village/hamlet in the district (Refer table no.19).

*vii. Forestry area diverted for non forestry purposes*

It is ascertained that there an area of 350 hectares of forest

area is diverted for hydroelectric project in Thoothukudi district (Refer table no.20).

*viii. Conservation of biological resources, wild like census, rare / threatened species of flora and fauna*

For the conservation of biological resources there is a bird sanctuary at a Gulf of Mannar 623 ha. and Vallanadu 1641 ha. Prominent species protected are corals, sea cow and migratory birds. There is no information available about wild life census in the district. Rare and threatened species of flora and fauna, namely, tephrosia barberi and poly carpa diffusa are available in the district (Refer table no.21, table no. 22 & table no. 23).

### 3.1.3 Mineral resources

Lime stone, brick earth, sand, rough stone and gravel are the mineral resources in the district with an yield of 347735 tonnes, 19780 tonnes, 23170 tonnes, 42120 tonnes and 15310 tonnes respectively. Total number of areas and values are given in the table no: 24).

### 3.2 Water resources

Tambraparani river which rises in Agasthiyamalai of the western ghats, flows through Srivaikundam and Thiruchendur taluks and joins the sea at Punnakayl in Srivaikundam taluks. Pambayar and Manimuthar are the chief tributaries of tambraparani, which passes through the district. The malattar and uppodai flowing in Kovilpatti taluk are drainage courses.

*i. Catchment area of river basins*

Tambraparani and Manimutharu are the catchment areas of river basins, which have their place of origin in the Pothigaimalai. The former has a length of 120 kms and the latter has a length of 98 kms. Necessary information is furnished in the table no.25.

*ii. Basin wise status of the ground water availability*

Ground water recharge, utilisable ground water recharge and balance groundwater available for development is 28369 ha.m. 24117 ha.m. and 11514 ha.m. respectively in the district. Basin-wise informations are furnished in the table no.26.

*iii. Details of dams and reservoirs*

Pabanasam dam, Manimutharu dam and Eppodumvernam dam is built in the district. The dam water is used for irrigation of 2090 hectares. The former has a design capacity of 5500 mcft. and the middle has a design capacity of 5511 mcft. And later has a design capacity of 3.57 mcm. (Refer table no.27).

*iv. Availability water spread area*

There have been 143 system tanks, 89 seasonal/rainfed tanks and 605 panchayat tanks maintained by the Public Works Department in the district. No information is available with regard to water area. The details are given in table no.28.

*v. Irrigation by different sources*

The total cropped area is 184932 hectares and the irrigated area to cropped area is 15.51%. The gross area irrigated by canals is 13 numbers and wells are 28673 ha. Thiruchendur block has the maximum extend of land (4422 ha.) irrigated by canals and wells. The details on irrigated area by different sources are given in table no.29.

*vi. Incidence of drought, flood and cyclone*

It has been ascertained from the available information that 3 taluks were affected by flood during 1992 - 1993 years. There was no drought and cyclone in the district during 1985-1996 period. The details are given in table no.30.

### 3.3 Fisheries production

Thoothukudi district has a coastal line of 60 kms. Marine fishing is practised in 15 coastal villages of the district. The fish production is increasing over the years as seen from table no.31.

*i. General fish seed production*

There is no information of fish seed production. Fish production both in inland and coastal areas have fluctuated from 1992 to 1996. The details on fish and fish seed production are given in Table No.32.

### 3.4 Heritage resources

*i. Protected and conserved monuments*

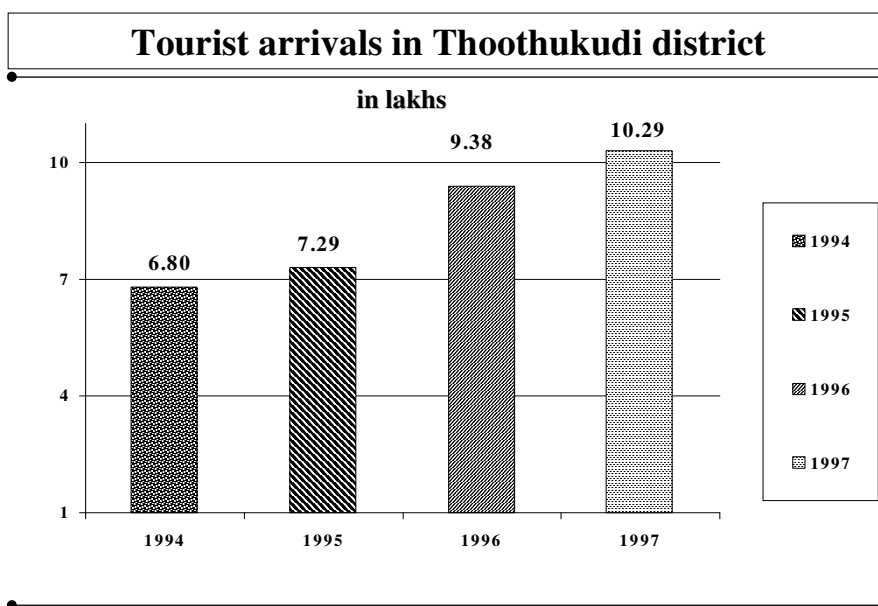
Ettayapuram and Ottapidaram taluks have monuments maintained by the Department of Archaeology in Thoothukudi district. The details are given in table no.33.

*ii. Places of tourist attraction*

Thiruchendur is said to be one of the six sacred abodes of Lord Muruga. The annual income of this temple is more than 50 lakhs. It attracts large number of devotees not only from different parts of the state, but also outside the state every year other places of tourist interest in this district are mentioned below:

Thiruchendur - Seashore, Panchalankurichchi - Memorial of the freedom fighters, Ettaiyapuram, Ottapidaram - manimandapam for the national poet Subramaniabharathi, Thoothukudi - port, Industries, Saltfields, the Wild-life sanctuary and Tiger sanctuary located at Kalakad and Mundanthurai are equally important tourist places.

There are 7 tourist places located at 4 villages/towns in the historical heritage area. The special significance of the area is Kattabomman palace, Bharathiyar & V.O. Chidambaram houses, Murugan temple, RC temple and Vettuvankoil temple. The tourist arrivals both domestic and foreign have increased during 1990-96 period. Necessary details are given in the table no.34 and table no. 35.



### 3.5 Energy resources

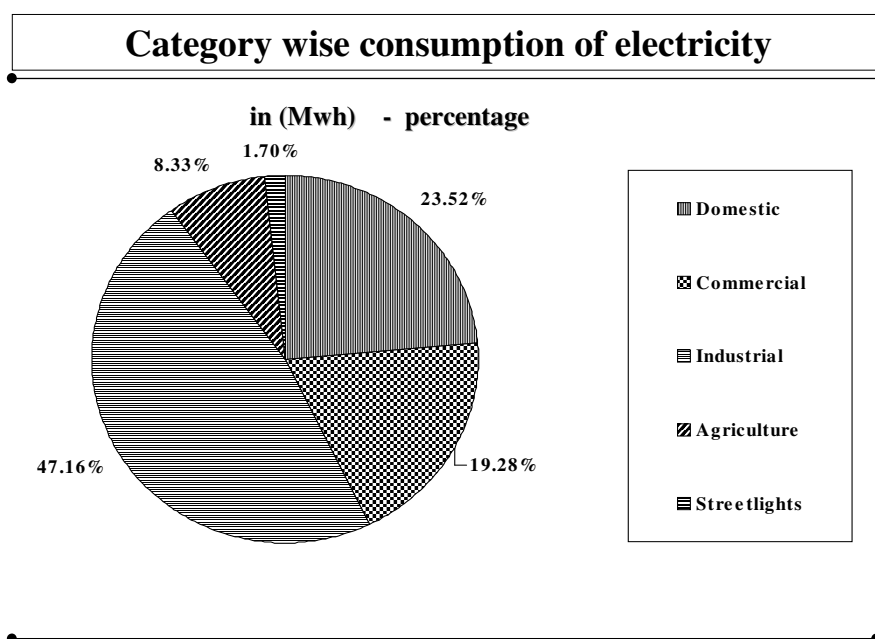
#### *i. Installed power projects*

There is one thermal power station with an installed capacity of 972 mw, 950 mw and 1050 MW, established in the year 1986, 1992 and 1996 respectively. There has been a fluctuating trend in actual power generation of 7010 mw in 1986, 6912 in 1992 and 7310 in 1996 (Refer table no.36).

#### *ii. Consumption of electricity*

There was a total consumption of 6885.783 mwh as on 1997-98 in the district. However data on consumption of electricity, industries the maximum which consume accounts about 47.16% of the total consumption. The domestic, commercial and agriculture sector consumes 23.52%, 19.28% and 8.33% respectively. The

category-wise consumption of electricity is given in the table no.37.



*iii. Electrification of villages*

Thoothukudi district achieved 100% village panchayat electrification in 1986. About 19729 pumpsets in 1991, 21095 pumpsets in 1996 and 21984 pumpsets in 1997 were energised (Refer Table No.38).

*iv. Non conventional & renewable energy sources utilisation*

The information is not available from the concerned authorities. (Refer table no.39).

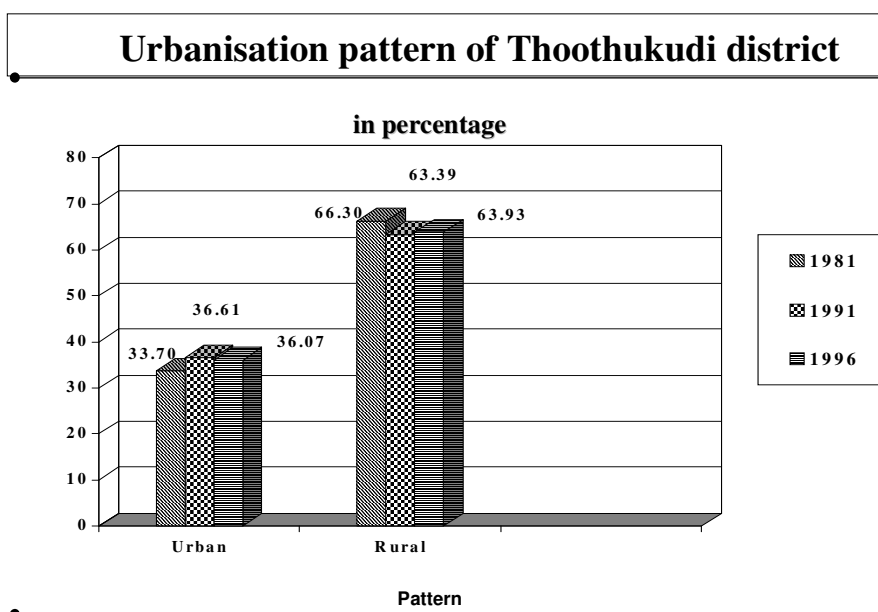
# 4

## Infrastructure

### 4.1 Urbanisation

#### 4.1.1 Urbanisation pattern

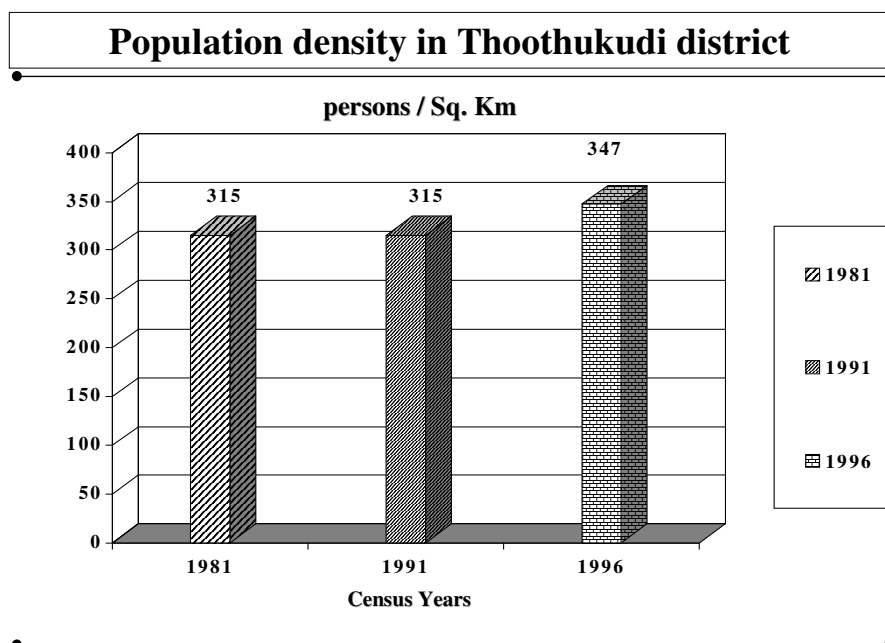
The proportion of urban population to total population has increased during the years 1981-96 from 33.70% to 36.07% and has increased at about 8.36% during 1991-96 period. Among the urban areas, Thoothukudi municipal town accounts for a greater share of urban population when compared to the other urban areas within the district. The proportion of rural population to total population has decreased from 66.30% to 63.93% during the years 1981-1996. The urbanisation pattern of the district is given in table no. 40.



#### 4.1.2 Density of population

The overall density of population has increased from 315 persons/sq.km in 1981 to 347 persons/sq.km in 1996. The density in urban area has increased from 1216 persons/sq.km in 1981 to 1664 persons/sq.km in 1996 and the density of rural area has also increased from 230 persons/sq.km in 1981 to 240 persons/sq./km. in

1996. The details on density are given in table no.41.



#### 4.1.3 Decadal growth rate in urban centres

The decadal growth rates in two municipalities have increased during 1961-1996 period. The population of the district has grown from 3,34,008 in 1961 to 577641 in 1996. Thoothukudi municipality and Thiruchendur town panchayat have registered the maximum growth rate. The details of decadal growth rate are given in table no. 42. The decennial growth rates for both urban and rural population have fluctuated from 1961 to 1991 (Refer table no.43).

#### 4.1.4 Urban slum population

There has been a steady increase in the percentage of town population to total population from 1981 to 1996. No information was available for slum population in the district (Refer table no.44).

#### 4.1.5 Trend in urbanisation and slums

The urban population has increased from 33.70% in 1981 to 36.07% in 1996 period. The details are given in table no.45.

#### 4.2 Infrastructure services and environmental status

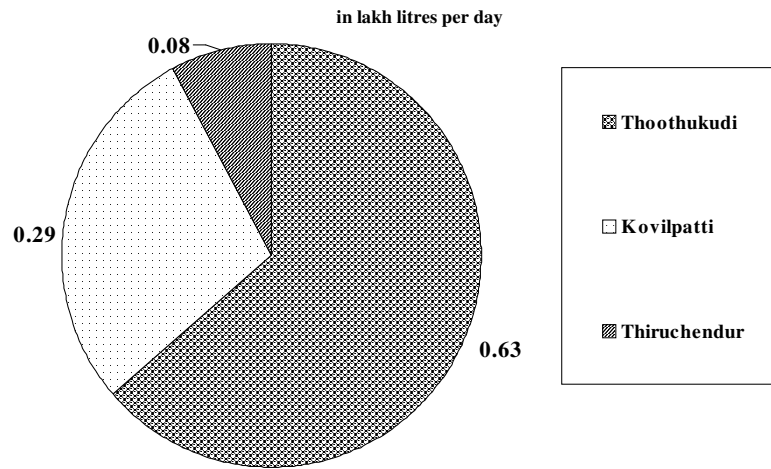
##### 4.2.1 Occupied housing units

The total occupied housing units of urban and rural have 133775 and 204950 respectively in the year 1991. Piped water supply in inside and outside of houses in urban areas was 62290 and 71485 respectively and in rural areas were 13290 and 191660 respectively in the same year. Nearly 50915 of the 95955 urban households and 74860 of the 108995 rural households lack of toilet of any type within the houses, thereby learning the majority of the population to depend on public convenience or open air defecation (Refer table no.46).

##### 4.2.2 Urban services

Surface water is the major source for protected water supply both in municipalities and in town panchayats. The percapita water supply for municipalities and town panchayats is 30 LPCD and 44 LPCD respectively. The municipality of Thoothukudi has the highest consumption of 152.42 lakh litres, while the town panchayat of Thiruchendur has 19.00 lakh litres. The municipalities have 10% at the maximum and the town panchayats have 45% of population uncovered for water supply. Details on water supply services are given in table no.47.

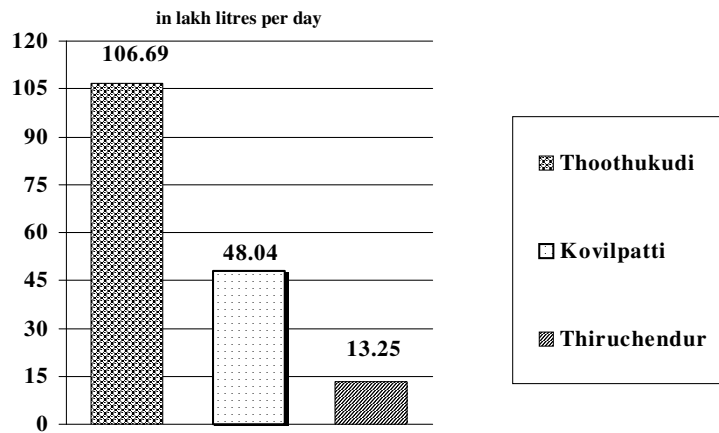
### Water supply in Thoothukudi district - major towns



#### 4.2.3 Domestic waste water generation and treatment

The estimated sewage generation is 155 lakh litres among municipalities and 84 lakh litres among town panchayats. The district does not have any organised disposal of sewage. The municipalities and the town panchayats have complete open drainage system. The details on domestic wastewater generation and treatment in the district are given in table no.48.

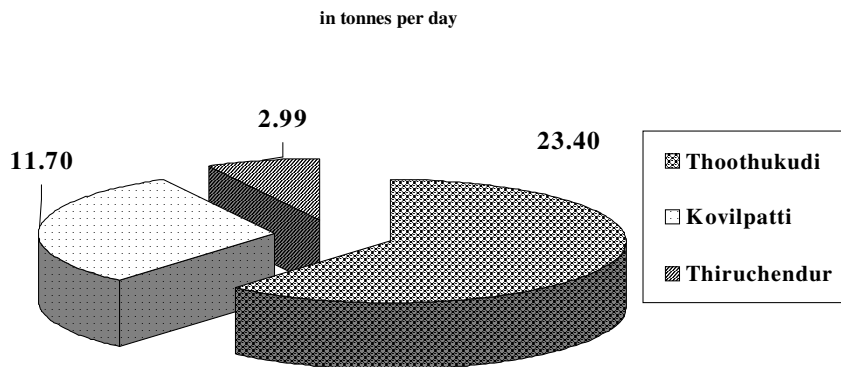
### Sewerage generation in Thoothukudi district - major towns



#### 4.2.4 Municipal solid waste generation

The solid waste generation of municipalities and town panchayats is to the tune of 35.10 tonnes and 23.45 tonnes respectively. The solid waste collection in municipalities and town panchayats is claimed to be 82.50% as of 1995-96, with a manpower of 432 for the solid waste management. Necessary details are given in the table no. 49.

### Solid waste generation in Thoothukudi district - major towns



#### 4.2.5 Composition of solid waste

It was observed that 10% of rubber and leather, 11% of plastics, 52% of compostable matter, 6% of wooden matter, 9% of glasses, 6% each metal and bricks & stones are the composition of municipal solid waste on wet basis in the district (Refer table no.50).

#### 4.2.6 Coverage of problem villages

It has been identified that out of 408 village panchayats, 154 village panchayats in 1986 in the district had problems with regard to supply of drinking water. Ottapidaram block has at maximum problem villages' (26) and 89 problem village panchayats have been covered during the VII five-year plan (1987-92) and 53 problem village panchayats have been covered during the VIII five-year plan (1992-97). Still 17 village panchayats have had problems with the

supply of drinking water. Necessary details are given in table no.51.

#### 4.2.7 Reported cases of water borne diseases

Gastro-enteritis, dysentery, cholera, jaundice and meningitis cases were reported during 1992-96 period and deaths of Gastro-enteritis are also reported during the same period and meningitis cases were reported during 1992-96 period. Necessary details are given in table no. 52.

#### 4.2.8 Facilities under Indian system of medicines

Allopathic, Homeopathic and Sidda are the most commonly practised system of medicine in the district and facilities for medical treatments are also available. In addition, there are few Ayurved and one Unani medicine hospitals available in the district. Information on hospitals, dispensaries and their admission capacity are given in table no.53.

#### 4.2.9 Population below poverty line

Population below the poverty line both in rural and urban areas is 94226 families in the district (Refer Table No.54).

#### 4.3 Transportation

The district has adequate communication facilities by road, rail and sea. The road transport is mainly operated by state owned transport corporation. Most of the towns, business centres, taluk headquarters and community development block headquarters are interlinked by road transport. The district is fed by following metre

**gauge lines of Railway:**

**(i) Chennai - Thoothukudi, (ii) Thoothukudi - Shencottai via Thirunelveli, (iii) Virudhunager - Quilon, and (iv) Thirunelveli - Tiruchendur.**

**In the eastern coast, Thoothukudi port, which is the second port in the State, is situated. History says that pearls and chanks available in coastal parts were sent to abroad from Thoothukudi even before independence era.**

#### **4.3.1 Development of roads, bridges**

**The district has 40.8 km. of National highways, 14.5 km. of State highways, 600.87 km. of Major district roads, 1435.79 km of other district roads, 1205.10 kms of panchayat roads and 193.82 kms of urban roads in 1996. Over and above, there are 7 major bridges and 21 minor bridges and culverts in the district in 1996. Relevant information is provided in table no. 55.**

#### **4.3.2 Growth of Vehicle population**

**The population of two, three and four wheeler vehicles steadily increased during 1986–1996 period. In 1996 the population of two, three and four wheeler vehicles were 5487, 43 and 918 respectively. Necessary information is furnished in the table no.56.**

#### **4.4 Industrial development and environmental status**

**The industries found in this district can be classified under three categories viz. household industries, small scale, and medium**

and large-scale industries. Safety matches, mat weaving & processing and manufacture of palm fibre and articles from palm trees are the main household industries. Safety matches are manufactured mainly in kovilpatti taluk. Manufacture of articles from palm tree is mainly found in Thiruchendur, Srivaikundam and Sattankulam taluks where larger areas are covered by palmyrah trees. There are many small-scale industries in this district, which are mostly engaged in manufacturing of chemical products, and food products. The items produced by large-scale industries are salt, cotton yarn/textiles, chemical and chemical products. The Spinning mills are located in Thoothukudi taluk M/S Dharangadhara Chemical works limited situated on sahurpuram of Thiruchendur, hexachloroethane, caustic soda, ammonium bicarbonate, trichloroethylene, perchloroethylene etc. There are many major rice mills for production of rice from paddy. Salt manufacture is one of the very important industry found in this district.

#### 4.4.1 Number of industries

There have been 17 Red category industries, 9 Orange category industries are under large-scale industries in the district, which are classified by the TNPCB based on the pollution caused to the environment. The details on the number of industries are given in the table no.57.

#### 4.4.2 Emission inventory of major industries

One thermal power station has been identified with the highest emission level in terms of SPM ( $211.5 \mu\text{gm}^3$ ), SO ( $191.66 \mu\text{gm}^3$ ), NO

(0.156  $\mu\text{gm}^3$ ), while the emission rates of CO & HC are not available from the authorities. However all the emission inventory industries of the district are found to be having the emission rates well under the set standards (Refer Table No.58).

#### 4.4.3 Air pollution stressed area

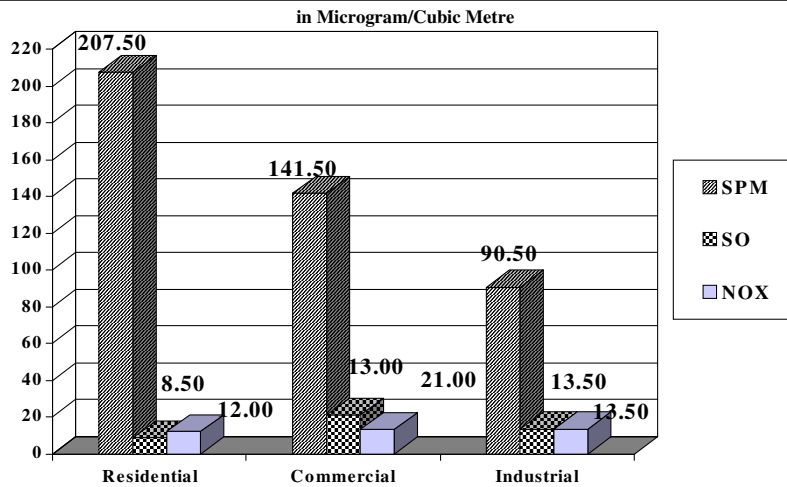
Air pollution is the major component of atmospheric pollution, which instantaneously affects human health and thus is an environmental hazard. Cement industries located in several basins, industries processing coral reefs from sea for calcium along coastal areas in Kallar, Tambraparani and Nambiyar basins, chemical industries in places like Chennai, Thoothukudi, Mettur and Cuddalore cause air pollution. The smoke let out must be checked for prescribed tolerance limits.

AVM building, Fisheries college and chemicals (SIPCOT) in Thoothukudi town, Arumuganeri at Kovilpatti taluk are identified air pollution stressed areas in Thoothukudi district. Major air pollution occurs due to industrial emission in these areas (Refer table no.59).

#### 4.4.4 Ambient air quality status

As far as the urban air quality status is concerned, the average SPM values and average  $\text{NO}_x$  values of commercial and industrial categories seem to be within the standards. However, the maximum value of these indicators is far beyond the set standards causing concern (Refer table no.60).

### Ambient air quality in Thoothukudi district



#### 4.4.5 Water quality

From the groundwater point of view, the coastal belt possesses a water quality problem. In several places along the coast either the groundwater is naturally saline or it is artificially made saline by over extraction and consequent intrusion of seawater into the land aquifers. The areas mainly affected from seawater intrusion into the land aquifers are Kuttam areas in Thirunelveli, Athisayapuram, and Puthantharuvai in Thoothukudi east.

Under MINAR's Scheme, TNPCB is monitoring the quality of water from a sampling station of Tambraparani riverbed in arumuganeri testing point in Thoothukudi district. DO value of water is slightly exceeding the standard value (Refer table no.61).

#### 4.4.6 Discharge of industrial effluents

**The industrial wastes / effluents allowed into the river courses cause water pollution in several areas. The following are the location of industries, which cause severe pollution of surface water or ground water:**

- Major industries located in Thoothukudi in Kallar basin spoils marine eco-system.**
- Sterlite industry causes air and water pollution in Kallar basin.**
- Coasts viella and Sun paper mills in Tambraparani basin pollute Tambraparani.**

#### 4.4.7 Noise levels

**Figures on noise levels in industrial, commercial, residential and zones are not available in the district (Refer table no 63)**

### 4.5 Environmental status of coastal eco-system

#### 4.5.1 Industrial sewage discharge in the coastal waters

**The effluents from thermal power stations located near the seacoast must not be allowed into the sea without treatment. The effluents from Thoothkudi thermal power station affects pearl culture near the southern coast.**

Prawn culture and shrimp farming are done in coastal districts Thoothukudi. The effluents let out of these farms containing biodegradable wastes are not properly treated in many cases and hence pollute groundwater in adjoining areas, even upto a distance of 6 km which affects agriculture.

Thermal power station at 5 Km from Thoothukudi town and DCW ltd and heavy water plant is the red category industries. Effluent discharge from these industries into the land and sea respectively.

#### 4.5.2 Aqua culture activities

The major activity under aquaculture is fishery. The fisheries department functions with main objectives such as to increase fish production and to improve fishing and allied industries, to uplift socio economic conditions of the fisher folk. The activities of the department include development and exploitation of marine fisheries, inland fisheries in reservoirs, major irrigation tanks, estuaries and backwaters and are carried out both through departmental agencies and the Tamilnadu fish farmers development corporation (TNFFDC). The department provides assistance to fishermen by way of equipment, landing, berthing and infrastructure facilities, installing guide lights, ice plants and cold storage's, marketing, training and welfare measures for fishermen etc.

The department also monitors pearl culture for availability of matured oysters and is also the monopoly over tanks and tank

fishery. The fisheries department organises tank fishing at Thoothukudi in Thoothukudi district. Brackish water survey units at Muthupettai, Punnakayal, Pattukottai, and Thoothukudi. Besides fishery, brackish water and freshwater aquaculture is followed for shrimp and prawn farming. The fisheries department extends assistance for this through Brackish Water Fish Farmers Development Agencies (BWFFDA). The Department has established brackish water fish farmers' 10 places.

There are 33 Nos. of aquaculture units functioning in the district, which occupy an area of about 406 ha. of coastal area in Thoothukudi district. (Refer table no: 65)

#### 4.5.3 Wetland Habitats, their use and problems

No information is not available pertaining wet land habitats, their use and problems in Thoothukudi district (Refer Table No: 66.

#### 4.5.4 Potential hot spots along the coast

There is no information about the potential hot spots along the coast of Thoothukudi district (Refer table no: 67).

#### 4.5.5 Gulf of Mannar

There are twenty islands along the stretch of Gulf of Mannar, which is declared as a National marine park. All these 20 islands were transferred to the wildlife wing of the State Government in 1991 - 1992. The area was declared a biosphere reserve in 1989. The islands in the Gulf of Mannar region had been broadly classified as Thoothukudi, Vembar, Keelakarai and Mandapam groups.

**Destruction of the coral reef eco-system in the region, particularly the instability and deterioration of the thoothukudi group of islands - van, koswari, vilangushuli and karashuli had always been a cause of concern scientists.**

**The following activities threaten the Gulf of Mannar of Thoothukudi region: -**

**1) Illegal quarrying of the coral reefs for construction, industrial and chemical purposes. Mining is a threatening the integrity of the mangrove and sea grass.**

**2) Various types of fishing techniques such as fishing traps bottom trawls and dynamite fishing cause irreparable damage.**

**3) Several chemicals industries in the hinterland discharge their toxic effluents into the sea cause a diverting effect on the eco-system.**

**4) Construction of the break waters in the Thoothukudi harbour area had also changed the current flow pattern and sediment pattern and movement along the coast.**

**Suggestion prevent the devastation: - The most effective way is to create awareness among all the concerned including local people, fishing folk and the industries so that they recognised the area as a prospective zone of potential reasons which should be protected for the benefit of man-kind.**

## **5** **Environmental institutions**

### **5.1 Environmental education and research institutions**

**There has been no environmental education and research institution in the district. (Refer table no: 71).**

### **5.2 Environmental NGOs**

**There has been three NGO dealing with environmental related issues in the district. Their main activities of coastal pollution, control self - employment training, environmental improvement, marine research, coastal region people development in the Thoothukudi district. (Refer table no: 70).**

## Summary of Observations

On the basis of identified key environmental problems in the district, environmental improvement measures are suitably suggested. The key observations of the Environmental Profile of Thoothukudi district is briefed below:

### Demographic details

During the period of 1981-91, there has been an increase in the growth rate of population at about 8% per annum, warranting appropriate intervention.

**It is interesting and encouraging to note that the percentage of female literacy level has significantly increased during the past 15 years.**

### **Land resources**

**40.29% of the land area in Thoothukudi district is utilised for cultivation. Hence 4.18% of the land area remain as cultivatable wasteland.**

**The utilisation of chemical fertilisers and bio-fertilisers in the district is high.**

**New constructions of wells and check dams and conservation works can be undertakes for cropping area.**

### **Forest resources**

**The forest area in Thoothukudi district is about only 2.90%. Apart from the reserve forests, there are 13358 ha. of forest under green cover classification. The man made forest plantations have been restricted to the existing forest area in the district.**

**Conservation of biological resources is to be strengthened by**

the district administration.

The main sources of irrigation of the district happen to be canals and wells. Only 15.51% of the total cropped areas are irrigated by these sources.

### Tourism

There are six tourist places in the district.

The fish production has fluctuation in quantity and value has increased for the past 5 years. The inland and coastal fish production has fluctuated but there was no information for standard dry fish production.

### Urbanisation

There has been a marginal improvement in the power generation sector. The demand for electricity has not met, owing to the steady population growth and higher rate of consumption. Non conventional and renewable energy source of utilisation is not very much identified.

Urbanisation process in Thoothukudi district has been taking place at a higher rate.

Urban services like drinking water and solid waste management in the district is not promising and therefore efforts to

**create better urban services have to be initiated.**

### **Transportation**

**There is an increase in the use of two, three and four wheeler vehicles in the district.**

### **Environment institutions**

**There is no environmental research institute in the district of Thoothukudi.**

**Environmental NGOs may be involved in protecting the environment of the district.**

**Participative planning for environment management, creation of a management information system, environment management training to officers of the stake-holding government departments would go a long way in the environment planning efforts of the Directorate of Environment, Government of Tamilnadu in fulfilling its corporate objectives.**