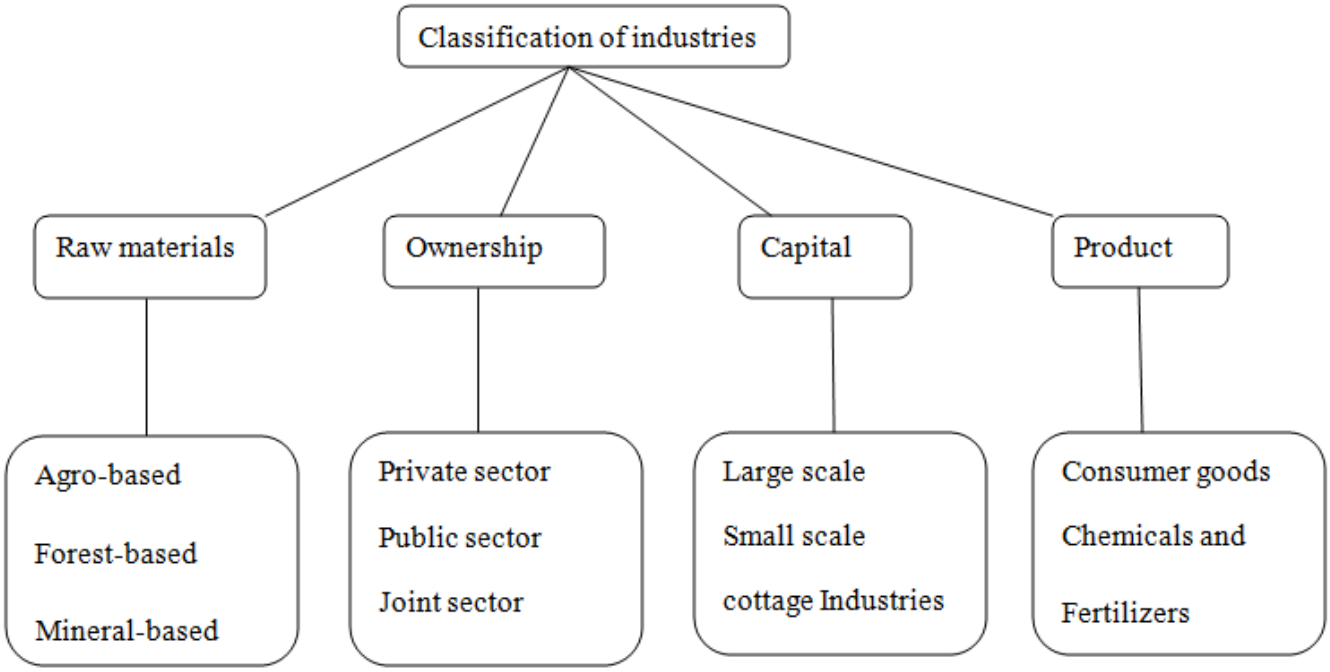
Tamilnadu Notes Part 6 to 10 in English

6. Tamil Nadu – Manufacturing Industries

Industry refers to the secondary type of occupation. It is the booming sector of Tamil Nadu. Tamil Nadu is ranked as third industrial state next to Maharastra and Gujarat. The act of converting the raw materials into finished and usable products is known as Manufacturing. A single manufacturing unit is termed as a Factory. Multiple units of same kind, which are spread over a larger area are termed as an Industry. Lakshmi Mills and Madura Coats are example of industrial units. About 34% of the state's income comes from the industrial sector.

Classification of Industries



Industries can be classified on the basis of:

a) Raw materials

b) Ownership

c) Capital involved and

d) Product

Classification on industries based on raw materials

An industry that uses agricultural products for manufacturing is termed Agro-based industry. Cotton textiles, sugar industry and food processing industries are Agro-based industries.

An industry that uses forest products as raw materials are known as Forest-based industry. Example: Paper and Pulp industry, Honey and Sandalwood product.

Industries using minerals for production are called as Minerals-based industry. Iron and steel industry, ceramics industry and cement industry are some of the mineral-based industries.

Classification of industries based on ownership

A Private industry is one which is owned by an individual or a group of people. TVS Motors is one of the notable private industries of Tamil Nadu.

All Government-owned industries come under the Public sector. Tamil Nadu Newsprint Paper Limited (TNPL) is state owned public sector industry.

Co-operative sector is one which is owned by a group of co-operative members who supply the raw materials for that industry. Most of the sugar factories in Tamil Nadu are in the co-operative sector.

When and industry is functioning under the partnership of two organizations it is said to be Joint sector. The nuclear power station at Kudangulam near Thirunelveli is a joint sector between Indian Government and the Russian Government.

Classification of industries based on investment

The industry which has huge investment in terms of capital and infrastructure, along with huge labour and production are known as large scale industries. Iron and steel industry is an example for a large scale industry. A medium-scale industry is one that runs with investment of Rs. 10 million (1-crore) to Rs. 100 million (10-crore). A small-scale industry has been defined as the unit that has investment up to Rs.10 million (1-crore).

Small scale industrial units are those which are engaged in the manufacturing, processing or preservation of goods. Goods such as clothes, toys, furniture, edible oils and leather goods are produced by small scale industries.

A Cottage industry is one wherein vary little investment is involved. The family as a whole works without any paid labourers. Locally available raw materials are used to produce the handicrafts. Volume of production and cost of production are low. Mats from grasses, (Pattamadai mat) toys from wood, Palm leaf containers are unique examples of goods from cottage industries of Tamil Nadu.

Classification of industries based on products

Consumer goods are those goods, which reach the consumers straight from the production unit. All perishable goods like food products and dairy products are examples of consumer goods.

Intermediate goods are products that are produced by another manufacturer. For instance, fabrics produced from cotton is an intermediate good, the clothing made from the fabric is a consumer good.

Basic goods are those goods which are produced on a large scale both for export and local consumption. For example: Iron and steel industry, chemicals and textiles.

Factors determining the location of Industries in Tamil Nadu

Location of industries in a particular place normally has many reasons for its localization. These reasons are the factors influencing the location of industries and are listed below:

- Raw materials
- Energy
- Capital
- Transport and
- Market
- Labour

Natural resources like water, minerals and energy resources determine the location of an industry. Textile industry, leather industry and paper industry require large quantities of water and

so are located close to water and so are located close to water sources. Industries like the cement industry, ceramic industry, and petro-chemical industry are located very near to the source of the raw materials. Aluminium industry highly relies on electricity and are located near the power stations or places with adequate supply of energy.

Distribution of Major industries in Tamil Nadu

The Major industries of Tamil Nadu are Textile industries, Sugar industries, Paper industries, Leather industries, Cement industries, Electrical equipments, Automobiles, Information Technology, Tourism industry and soon.

Textile industry of Tamil Nadu

Tamil Nadu plays a major role in the Indian textile industry in terms of production and export of yarn, fabrics, knitwear and garments. Tamil Nadu contributes nearly 25% of India's share in the export of cotton, yarns and fabric. Tropical climate, availability of raw materials, demand for cotton in market, power supply from numerous power projects and abundant cheap labour are favourable factors for widespread distribution of textile industries in Tamil Nadu.

Coimbatore, Pollachi, Udumalapettai, Thiruppur, Karamadai, Erode, Bhavani, Dindigul, Thirumangalam, Madurai, Palayamkottai, Papanasam and Theni are important centres for textile industry. Maximum unitsare concentrated in and around Coimbatore region. This is why Coimbatore region is known as "the Manchester of South India".

Districts of Coimbatore, Thiruppur and Erode contribute much for the state's economy; therefore, they are referred to as 'Textile Valley of Tamil Nadu'. Thiruppur alone contributes 70% of export of knitwear of Tamil Nadu. Erode specializes in garments and bedspreads. The city of Karur is known as the textile Capital of Tamil Nadu.

Silk Textiles

Tamil Nadu occupies the fourth place in silk textile production in our country. Kancheepuram silk is unique in its quality and is known for its traditional value all over the world. Arani, Rasipuram and Thirubuvanam are other silk centres of Tamil Nadu. Sericulture Training Institute in Hosur trains farmers to adopt sericulture along with farm work to accelerate rural industrialisation. Mettur, Madurai, and Ramanathapuram are specialized areas for manufacturing synthetic clothes.

Sugar Industry

Tamil Nadu produces about 10% of total sugar in India. Suitable climate and soil, for high yielding varieties, continuous irrigation facility, good transport, marketing facility and regularized co-operative sector are favourable factors for the widespread sugar mills in the state. A majority of sugar units in Tamil Nadu are functioning under the co-operative sector. At present Tamil Nadu has 42 Sugar Mills, out of which 16 are under the co-operative sector, 3 owned by public sector and 23 as private mills.

Sugar factories are concentrated in Villupuram, Cuddalore, Vellore, Erode, Coimbatore, Thiruvannamalai, Thiruchirappalli, Thanjavur and Madurai districts. Jiggery, kandasari, and sugar are products from the sugar industry. The by-product bagasse (the crushed stem of sugarcane after extracting juice) is used as a raw material for paper industry. Tamil Nadu government has set up new integrated sugar complexes with different options of co-ethanal production, tissue culture lab, soil testing lab, fuel energy and bio-composting. Names of such units are given in the table.

Table: Distribution of integrated sugar complexes

Name of the Mills	Taluk	District
Kothari-Sathamangalam	Ariyalur	Ariyalur
Rajashree – Semmedu Dharani – Kalaianallur	Gingee Sankarapuram	Villupuram
Sakthi- Modakurichi	Erode	Erode
Empee Sugars – Idaikal	Ambasamudram	Thirunelveli
Shree Ambika – Manjini	Attur	Salem
Dhanalakshmi Srinivasn-Udumbiyam	Veppanthattai	Perambalur
Bannariamman – Kolunthampattu	Thandarampattu	Thiruvannamalai

Food and Beverage Industry

Food and Beverage based industry flourish well in Tamil Nadu. Mango pulp is processed and exported. Instant food varieties and ingredients for cooking are manufactured and marketed locally as well as exported. Snacks items and biscuits are marketed on a large scale. Tamil Nadu with its long coastline offers opportunities for industries based on marine products.

Paper industry

Tamil Nadu stands second next to Andhra Pradesh in paper production in our country. The state produces about 12% of the paper in our country. Bamboo, grass, and Bagasse from sugarcane are raw materials for paper industry Soda, sodash, chlorine, sulphur, woodpulp, and plenty of water are other requirements for setting up of paper industries.

Pukkathurai in Kancheepuram district, Bhavanisagar, Pallipalayam, Pugalur, Paramathi, Vellore, Coimbatore, Nillakkottai, and Cheranmadevi are centres of paper mills in Tamil Nadu.

Tamil Nadu Newsprint and Paper Limited(TNPL) was set up with aid of World Bank in 1979 in Kakithapuram near Pugalur in Karur district. It is the largest producers of Bagasse based paper in the world with the annual consumption of bagasse terms 1 million tonnes per annum. It caters to the need of newsprint papers throughout Tamil Nadu. It produces 600 tonnes of newsprint paper per day. Other than newsprint, papers for telephone directory, computers, offset printing papers, copier machines are also produced and marketed by the TNPL.

Leather industry

Tamil Nadu accounts for 70% of national tanning factories and 60% export of India. Leather industry occupies an important place because of its wide dispersal, sizeable employment and export potential. Leather industry depends on cattle wealth. It is concerned with the treatment of raw pelt of animals to make them suitable for the manufacture of various articles.

> The pelt of large animals and cattle are known as 'hide' and those of smaller ones like sheep and goats are called 'skin'.

Tanning is a process of making leather, from the skins of animals, with the use of tannin, an acidic chemical compound. Tanning makes the skin become flexible, less water-soluble and more resistant to bacterial attack. Tannery is the term given to place where animal skins are processed.

If tanning is done with vegetative matter, it is known as vegetable tanning process. Vegetable tanned hide is flexible and is used for making furniture. If tanning is done with chemicals like chromium and fatty matter, it is known as mineral tanning process. Chrome tanning is faster than vegetable tanning and it produces stretchable leather which is excellent material for making handbags and garments.

Chennai, Vellore, Kancheepuram, Thiruvallur, Thiruchirapalli, Dindigul and Madurai districts have widespread centres for leather industry. Chennai, Vellore, Ambur, Ranipet, Vaniyambadi, Dindigul and Thiruchirappalli are the main centre's of leather industry.

Cement industry

Tamil Nadu stands fourth in cement production. It accounts for 10% of the country's cement production. Tamil Nadu Cements Corporation Limited(TANCEM) is wholly owned by the Government of Tamil Nadu and manufactures Ordinary Portland Cement(OPC) and Super Star Cement exceeding the requirements prescribed under the Indian standards. The new materials required for cement production are limestone, dolomite, gypsum, clay and coal. All of these are mined in Tamil Nadu. Major centres of cement industry are Sankari, Madukarai, Puliyur, Kunnam, Sendurai, Ariyalur, Dalmiapuram Manamadurai, Thulukapatti, Allankulam, Sankarnagar and Thazaiyuthu.

Automobile industry

Tamil Nadu earns 8% of its GDP from automobile industry. This industry contributes for about 21% of passenger cars, 33% of commercial vehicles produced in India. Chennai city is the base for 30% of India's automobile industry and 35% of its auto components. This industrial supremacy has resulted in Chennai being known as the "Detroit of Southern Asia".

Chemical industry

Chemical industry includes, production of chemicals, drugs, fertilizers, petrochemicals, soaps, detergents, cosmetics, medicines, synthetic rubber and plastics. Most of the chemical industries are clustered around Chennai(Manali), Cuddalore, Panangudi(Nagapattinam) and Thuthukudi. The notable chemical industries of Tamil Nadu are SPIC (Southern Petrochemical Industries Corporation Ltd) and Manali Petrochemicals Limited. SPIC is the largest producer of fertilizers in India and covers 12 states and caters to the customers through 4000 outlets. It produces around 2 million tons of fertilizers annually.

Pfizer pharmaceutical company and Dow Chemicals are important chemical units which have research and development facility in Chennai.

Electrical and Electronics Industry

Electronics is a growing industry in Tamil Nadu. Many major global telecommunications like the Nokia, Flextronics, Motorola, Sony-Ericsson, Foxcon, Samsung, Cisco, Moser Baer and Dell

have chosen Chennai as their South Asian manufacturing hub. Products manufactured include circuit boards and cellular phone handsets.

Bharat Heavy Electricals Limited located at Thiruchirappalli is one among the six large units of India. It produces boilers generators and turbines used in the production of hydro-electricity.

Software Industry Infosys' campus at Mahindra World City near Chennai

Tamil Nadu is the second largest software exporter (by value) in India. It has the leading BPO sector in the country next to Karnataka. Major national and global IT companies such as Verizon , Hewlett-Packed, IBM, Accenture, Ramco systems, Computer Sciences Corporation, Cognizant Technology Solutions, Tata Consultancy Services, Infosys, Wipro, HCL, Tech Mahindra, Polaris, Aricent, Mphasis Acme Technology Pvt Ltd., Convansys, Ford Information Technology, Xansa, iSoft, iNautix, Electronic Data System, Bally and many others have established their branches in Chennai.

India's largest IT Park is in Chennai, jointly constructed and maintained by Ascendas India Ltd, a Singapore-based company engaged in providing business space solutions, with Tamil Nadu Industrial Development Corporation(TIDCO).

Other notable industries of Tamil Nadu

Perambur Integral Coach Factory (ICF) is the largest in Asia to produce railway coaches in Tamil Nadu. "**A**rmoured **V**ehicles and **A**mmunition **D**epot of **I**ndia"(**Avadi**) is about 23km northwest of Chennai. The Heavy Vehicles Factory produces battle tanks. Salem Steel Plant is a Public Sector company undertaken by the Government of India. Sivakasi is a big industrial centre in Virudhunagar district. It is world famous for its fireworks and safety match boxes. Sivakasi produces 90% of India's fireworks. It is also known for offset printing. Sivaksi is known as ;Little Japan'. Neyveli, apart from the production of thermal power, has a fertilizer unit and a ceramic united attached to it. Thanjavur and Kumbakonam are specialized in the production of bronze statues and musical instruments.

"Tamil Nadu is the first State in the country to develop a well-defined Biotechnology Policy and to set up an All Women Biotechnology Park.

Chennai is second to Mumbai for its vibrant and innovative film industry.

Tourism industry

Tourism is considered as an industry because of its enormous potential in creating employment for a large number of people and for its substantial foreign exchange. Tamil Nadu's

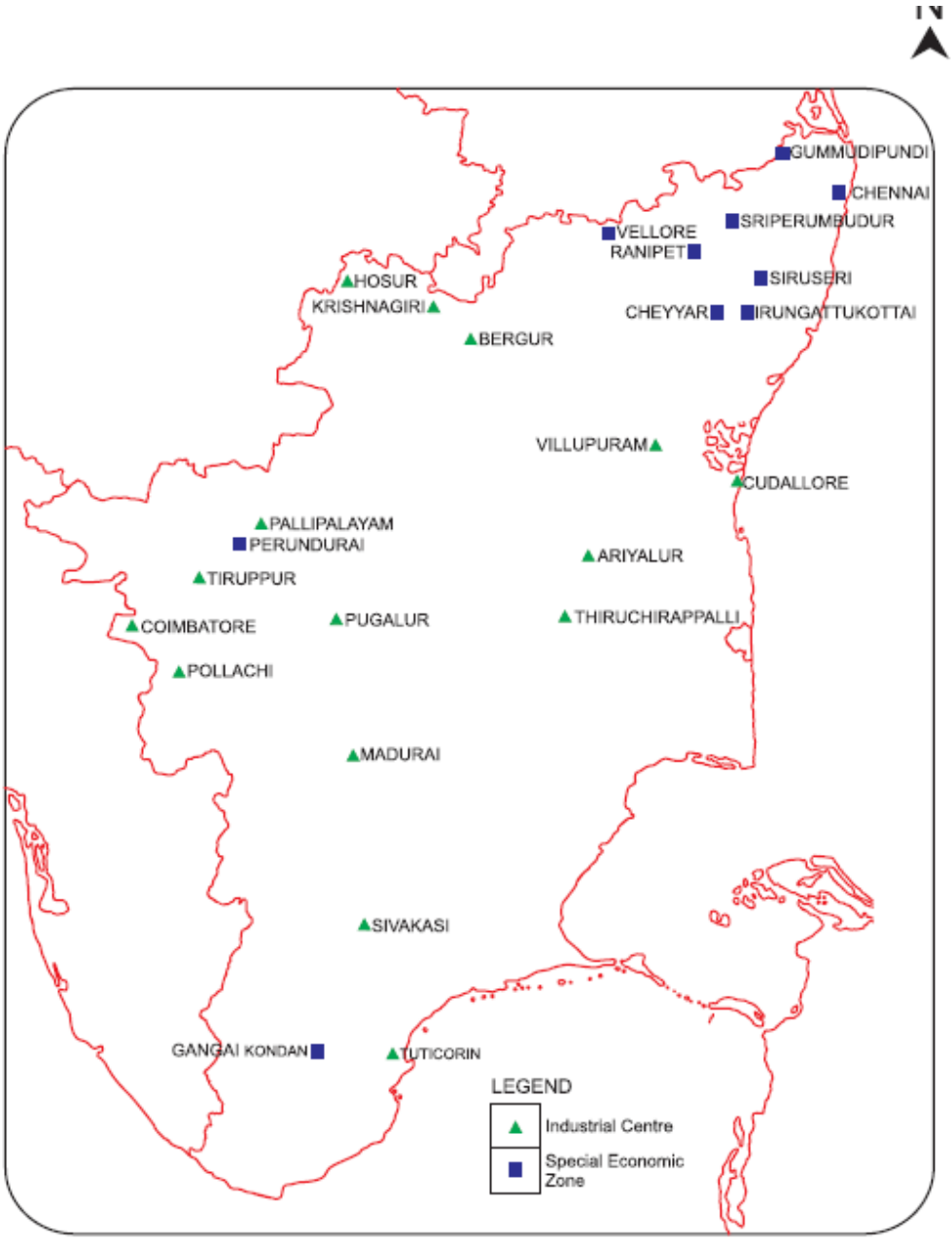
tourism industry is the second largest in India, with an annual growth rate of 16%. Presence of ancient monuments, pilgrim centres, hill stations, a variety of natural landscapes, long coastline, along with rich culture and heritage makes Tamil Nadu the best destination for tour lovers.

Tourism in Tamil Nadu is promoted by Tamil Nadu Tourism Development Corporation(TTDC), a Government of Tamil Nadu undertaking. Health/Medical tourism which is part of tourism industry is hosted by the leading health care centres in Chennai.

State Industries Promotion Corporation of Tamil Nadu(SIPCOT) Limited, a fully government owned premier institution, established in the year 1972, has been a catalyst in the development of small, medium and large scale industries in Tamil Nadu.

In order to promote an industrial base for export, the state government has setup special regions as Special Economic Zones(SEZ). These regions have ample facilities for manufacturing. They are capable of attracting foreign investor, and aim at promoting trade at the international level. Tamil Nadu has set up SEZ in the following places: Sriperumpudur Industrial Park, Irungattukottai Footwear SEZ and Orgadam Industrial Growth Centre in Kancheepuram district, Ranioet Leather Sector SEZ, Perundurai Engineering products SEZ, Cheyyar Automobile/Auto Ancillary SEZ, and Gangaikondan Transport Engineering Goods SEZ.

Tamil Nadu Major Industrial Centres and Special Economic zones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GUMMUDIPUNDI
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SIRUSERI
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IRUNGATTUKOTTAI
BERGUR
VILLUPURAM
CUDALLORE
PALLIPALAYAM
PERUNDURAI
ARIYALUR
TIRUPPUR
COIMBATORE
PUGALUR
THIRUCHIRAPPALLI
POLLACHI
MADURAI
SIVAKASI
GANGAI KONDAN
TUTICORIN
LEGEND
Industrial Centre
Special Economic Zone

7. Tamil Nadu - Transport and Communications

Transport and Communications play a vital role in the economic development of Tamil Nadu. Transport system helps with the easy movement of human beings and materials. It acts as the arteries and veins of national development. The transport system is of four types. Roadways, Railways, Waterways and Airways.

Roadways

Of all the States of India, Tamil Nadu has a sound network of roads. All economic sectors of the State is inter connected and interlinked by roadways. The State Transport Corporations operate the public transport system along with private transport organizations. Compared to other States of India, Tamil Nadu State Transport Corporations operate bus services in a fullfledged, facilitating manner. Roadways may be classified into four types. They are:

- National Highways;
- State Highways;
- District roads; and
- Village Roads.

There are 24 National Highways covering a total distance of 4500km. Golden Quadrilateral Project. To meet the ever increasing demand from public, there are seven transport corporations functioning in the State. They are given below with their area of operation:

1. Metropolitan Transport Corporation-Chennai and sub urban areas – Chennai as head quarters.
2. Tamil Nadu State Transport Corporation-Villupuram(Cuddalore, Vellore, Tiruvannamalai, Kanchipuram and Tiruvallur districts with Villupuram as head quarters).
3. Tamil Nadu State Transport Corporation- Kumbakonnam(Thanjavur, Thiruvarur, Nagapattinam, Karaikkal(Puducherry) Thiruchirapalli, Karur, Perambalur, Sivagangai, Ramnad and Pudhukottai districts with Kumbakonam as head quarters).
4. Tamil Nadu State Transport Corporation-Salem(Salem, Dharmapuri, Namakkal and Krishnagiri districts with Salem as head quarters).
5. Tamil Nadu State Transport Corporation- Coimbatore(Coimbatore, Trippur, Erode and the Nilgiris districts with Coimbatore ass head quarters).

6. Tamil Nadu State Transport Corporation – Madurai(Madurai, virudhunagar, Dindigul and Theni districts with Madurai as head quarters).
7. Tamil Nadu State Transport Corporation- Thirunelveli(Thirunelveli, Thuthukudi, Kanyakumari districts with Thirunelveli as head quarters).

Table: Length of roads in km

Length of roads	(in km.)
1. National Highways	4,500
2. State Highways	5,525
3. Corporation and Municipalities	17,161
4. Town Panchayat Roads	15,591
5. Village Oanchayat Roads	63,538
6. Panchayat Union roads	32,791
7. Forest Roads	3,930

Apart from these the State has vehicular transport in the form of two and three wheeler vehicles which constitute about 83.9%. The number of registered vehicle population in Tamil Nadu had increased to 10.064 million in 2007-08. There are 64 vehicular zones in the States. Among the Regional Transport Offices, Chennai is the largest one which has - 61 centres.

Tamil Nadu Roadways

Recent Developments in Road Transport

- Conversion of single lane of State Highways into double lane and multilane.
- The wideningand improvement of road from Madhyakailash in Adyar to Siruseri on Old Mahabalipuram Road(OMR) for about 24km was laid. This is referred to as IT Expressway and it serves as connectivity to all IT companies.
- The East Coast Road(ECR) that is built along the coast of the Bay of Bengal connects Chennai and Cuddalore via Pondicherry. It gives rise to spectacular scenic views with beaches and fishermen hamlets. Presently, the East Coast Road has been extended to Thuthukudi via Chidambaram, Nagapattinam and Ramanathapuram.
- The Golden Quadrilateral Project of the National Highway Development that runs for about 1,232 km in Tamil Nadu has been completed.
- Most of the mofussil traffic had been diverted on to the byepass roads to avoid traffic congestion.
- CMBT(Chennai Mofussil Bus Terminus), which is the largest modern bus terminus in Asia, Koyambedu, Chennai has been established.
- Bridges and flyovers have been constructed in many districts of Tamil Nadu along the National Highways. Some of the notable ones may be found in Chennai City-Chennai Airport Flyover, Perambur Flyover, Anna Flyover and Kathipara junction Flyover. In Vellore, Tindivanam and Ulundurpet flyovers have been constructed to ease vehicular traffic congestion.
- Ring roads that encircle urban areas to divert vehicular traffic to avoid traffic passing through the centre have been implemented.
- SETC operates a variety of buses, namely, semi-deluxe, super-deluxe, video coach, ultra-deluxe, Volvo-deluxe and air suspension buses within Tamil Nadu an adjacent States.

Railways

Tamil Nadu is well served with a good network of railways as part of the southern Railways with headquarters at Chennai. Rail tracks are classified into:

- Broad gauge;
- Metre gauge;
- Narrow gauge; and
- Suburban Railway.

In Tamil Nadu the total length of railway tracks is about 5,952 km and total number of railway stations is 532 to connect all the major cities of Tamil Nadu.

Tamil Nadu Railways

The Southern Railways zones have been demarcated into six divisions, namely, Chennai, Madurai, Salem, Palakkad, Thiruvanathapuram and Thiruchirappalli. Main rail kunctions in the State are:

Chennai, Erode, Coimbatore, Thirunelveli, Madurai, Thiruchirappalli and Salem.

Chennai has a well established suburban railway network, with three different lines connecting Chennai with Arakkonam, Gummidipoondi and Chengalpattu, MRTDS Railway line connects Chennai Beach to Velachery.

Recent developments in railways

The metre gauge rails are being converted into broad gauge of which 26% of the length had been electrified.

Gauge conversion project has also been taken up from Chennai Beach to Tambaram, Chengalpattu and other suburban areas.

Waterways

Waterways are the cheapest means of transport. It may be divided into inland waterways and seaways. The State has 1000 km of coastline. The three major ports of Tamil Nadu are Chennai, Thuthukudi and Ennore. They play a crucial role in the provision of infrastructural support in the State. Minor Ports are anchorage ports where cargo is transhipped from the vessel to the shore. Some of the minor ports are Cuddalore, Nagapattinam, Kolachal and Rameswaram.

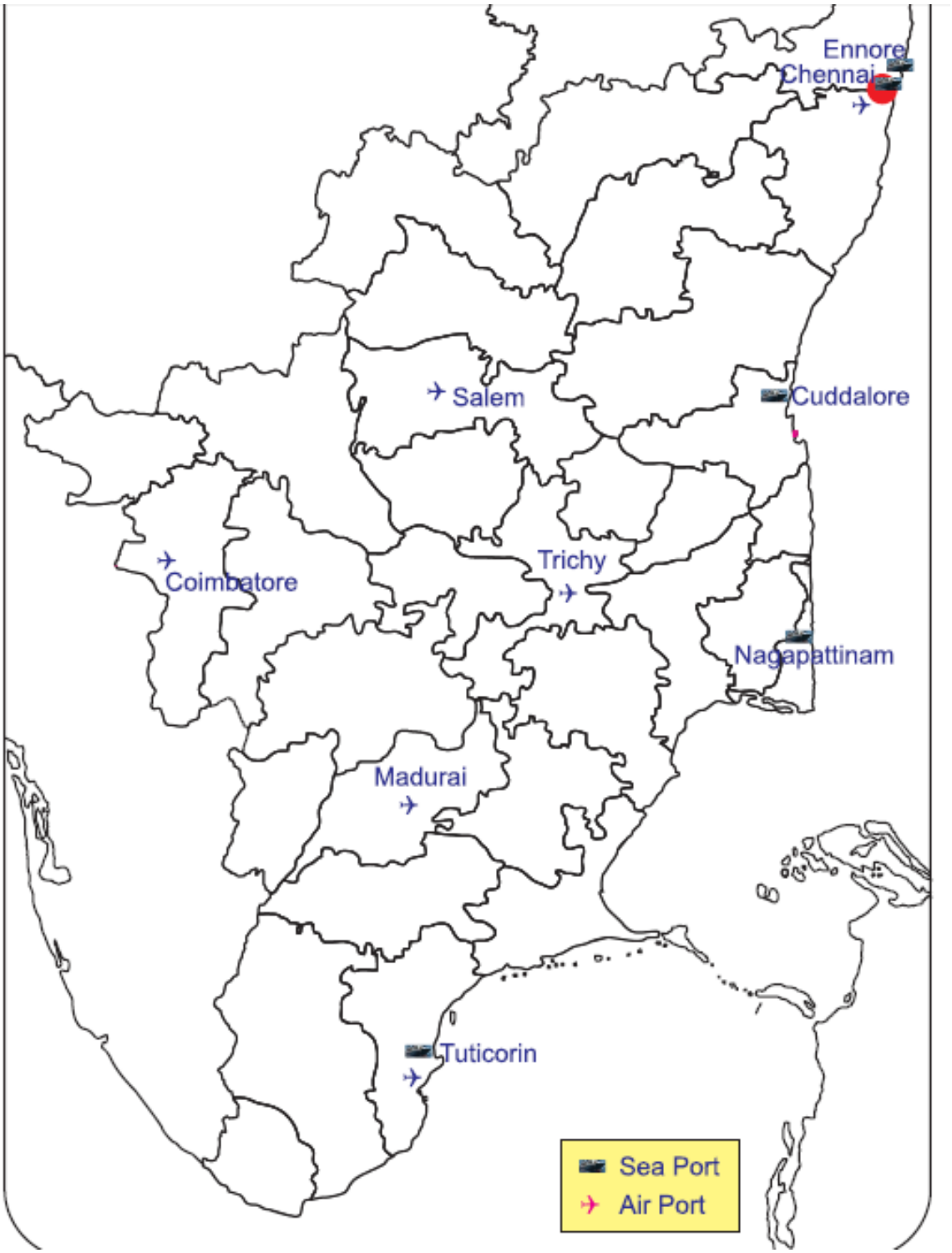
Cargo handled by major ports	
	(in million tonnes)
1. Chennai	57.15
2. Tuticorin	21.62
3. Ennore	11.56

Projects Under Progress Sethusamudram Shipping Canal Project (SSCP)

It aims at creating a navigation channel from the Indian ocean to the Bay of Bengal through Gulf of Mannar, Adam's Bridge, Palk Bay and Palk Strait within the Indian Border. This project is of strategic importance as it connects the neighbouring Continents and countries. It also acts as a catalyst for industrial development, super trade and commerce advance coastal shipping and generate employment.

Tamil Nadu

Major Seaports and Airports



1. Buckingham canal that once connected Marakkanam in villupuram with Vijayawada in Andhra Pradesh has lost its importance.
2. Vedaranyam canal that connects Vedaranyam and Nagapattinam and has also lost its importance.

Airways

Airways is the fastest and costliest means of transport which can carry passengers, freight and mail. They connect local, regional, national and international cities. Tamil Nadu has a major international airport, which is named as Anna international Airport. It is connected to 19 countries and operating more than 169 direct flights every week. This is currently the third largest airport in India after Mumbai and Delhi.

Chennai has direct air services to Sri Lanka, Dubai, Germany, Indonesia, Malaysia, England, Maldives, Saudi Arabia and Singapore. The air services that operate between Chennai and Coimbatore through Salem promote the industrial development of Salem and Mettur.

International Airports

1. Chennai (Anna)
2. Coimbatore
3. Thirucirappalli

Domestic Airports

1. Chennai (Kamarajar)
2. Madurai
3. Salem
4. Tuticorin

Airports	Cargo handled (in tonnes)
1. Anna International (Chennai)	2,27,704
2. Kamarajar Domestic(Chennai)	42,905
3. Coimbatore	1,858
4. Madurai	375
5. Thiruchirappalli	238

Communications

The means through which ideas and information are exchanged are called "called of Communication". They are Personal Communication and Mass Communication Networks Personal Communication includes Postal Services, Telegram, Telephone, Internets, E-mail and Fax Mass Communication Network is carried on by the Government agencies. They are:

Print Media (books, Journals, magazines and newspapers) and Electronic Media (Radio, Television, Telecommunications, Mobile phone, E-mails, E-commerce and Teleprinter).

Postal Network and Telegraph

Tamil Nadu has four postal districts, namely:

Zone/ Districts	Headquarters
Chennai	Chennai
Western	Coimbatore
Central	Thiruchirappalli
Southern	Madurai

The postal Department has allocated the Postal Index Number (PIN) to facilitate faster delivery of letters in the form of Air Mail Service, Railway Mail Service and Speed Post.

Postal and Telegraph offices in Tamil Nadu

Number of Post Offices alone: 12,115 Number of Post and telegraph offices : 3,504.

In India the BSNL is a major service provider. Direct calls can be made across the country and the world with STD(Subscriber Trunk Dialing), PCO(Public call office) and ISD (International Subscriber Dialing) facilities respectively. Today, Tamil Nadu has :

Telephone exchanges- 2,408

Telephone subscribers – 33,46,906

There is no Telegram service at present.

The private basic telecom services are provided by Bharati Infotel, TATA, Reliance, Airtel, Aircel, Vodafone, Uninor.

Telecommunications

Telecom growth has intimate relationship with the IT sector. The State has witnessed a boom in the number of PCOs and the landline segment. Rapid expansion in the telecom sector is accompanied by simultaneous significant technological changes. Cell phones are one such advancement in the field of technology. Even the internet can be accessed using cell phones. The world is shrinking with increasing spread of the communication network. The following are the services provided by the BSNL:

Cellular Subscribers (Cumulative in Lakhs)

Year	Tamil Nadu	All India	Percentage share to All India
2002-03	6.15	126.88	4.85
2003-04	16.28	261.5	6.2
2004-05	33.53	410.2	8.17
The total number of cellular phones in use in Tamil Nadu: 3337087			

Internet is provided to subscribers in the name of Data One Broadband.

Both post-paid and prepaid cell phone services are offered through public as well as private service providers,

All India Radio (AIR)

Indian radio broadcasting, which was started in 1927, became All India Radio(AIR) in 1936. AIR has 15 Radio Stations in Tamil Nadu. Private Broadcasters have set up FM Radio Stations and broadcast a variety of programmes on education, agriculture and entertainment.

Doordharshan

It is one of the largest terrestrial networks in the world. All the major live telecasts of national and international programmes bring the viewers under one roof. It transmits education all programmes for Schools and Universities through "Edusat".

Internet and Intranet

The present world is networked with the World Wide Web, known simply as the internet and Intranet. Of the two, internet plays an important role in the field of education and transfer on knowledge. Internet can be accessed by any individual from any part of the world.

An Internet is a private computer network. Intranets are websites that can only be accessed within a company through their internal network.

Satellite

It is the latest means of communication which has brought revolution in communication all over the world. India's communication network is operated through two satellites, namely, Indian National Satellite (INSAT) and Indian Remote Sensing Satellite(IRS). These two, apart from communications, assist in the prediction of meteorological events and natural resources management.

Print Media

It is another powerful medium to convey information through various news agencies of India that are operating under the umbrella-Press Trust of India, United News of India and Press Information Bureau.

Communication Technology and its advantages

It plays a vital part not only in personal life but also important role in business and education through satellites.'

People can send and receive mails using e-mail to get information on job vacancies, admission to Universities and to obtain birth and death certificates.

Shopping via internet(e-commerce) is a trend now-a-days.

Telemedicine makes it possible for people in remote areas to get correct treatment at appropriate times.

Online payment of phone bills, electricity bills and online ticket booking can also be made.

D-Mat form of shares for share broking and video conferencing using video chat through webcam are also done using internet.

Communication technology has developed to such an extent that even remote villages are connected to any part of the world, making the world a global village. GPRS (General Packet Radio Service) is a way of sending data through radio waves which is currently being used to transmit

voice. GPS (Global Positioning System) looks like a Mobile phone which captures signals from multiple satellites and provides information on the location of a place.

Disaster Management

The Earth we live is a dynamic self regulatory system. In the modern world with the best available communication facilities we are informed of extreme events that occur in any part of the world. In many circumstances events like the volcanic eruption, the earthquake and flood become harmful to human society.

Hazard is a dangerous event, natural or human induced that cause injury, loss of life and damage to property.

A Disaster is an event which causes enormous physical damage to property, huge loss of life and drastic change in the environment. The economic, social and cultural life of the people is affected and they need external help for food, shelter, medicine, financial and social support to overcome the disaster. Disaster is classified according to the origin as natural and man-made Disaster.

Forces Responsible for Disaster

Type of Disaster	Forces	Events
Geophysical disaster.	Earth's internal force.	Earthquakes, landslides, tsunami and volcano.
Hydrological disaster.	Surface water/glacier flow.	Avalanches, flood.
Climatological disaster .	Atmospheric events, Interaction of atmosphere and ocean.	Extreme temperature, drought, wild fires, Cyclones, storms, surges, waves.
Man-made disaster.	Human negligence.	Industrial accidents, pollution, acid rain, road accidents, leakage of toxic waste, war.

Disaster Management:

Disaster Management involves a continuous process of planning, organizing, coordinating and implementing measures to avoid loss of life and property. The role of the authority is to frame safe disaster management methods to protect people and property. Disaster Management cycle includes four stages namely preparation, response, recovery and mitigation.

Disaster Management cycle

Hierarchy of Disaster Management in India

National Disaster Management Authority.(NDMA)
Headed by the Prime Minister

↓

District Disaster Management Authority
Headed by the respective Chief Ministers

↓

District Disaster Management Authority
Headed by the District Collectore or District Magistrate

↓

Block Disaster Management Committee
Head by BDO and NGO's

↓

Village Committee for Disaster Management
Panchayat raj and Committee

The Tsunami of 2004 occurred in the Indian Ocean and the earthquake, China 2008 are the examples of the disaster.

The Bopal Gas(Methyl Isocyanate) tragedy of 1984 in a Carbide plant is also an instance of disaster.

India is prone to natural disasters due to its geological set up. The Indo-Australian plate is still moving at an average of 2 cm every year toward Eurasia, still pushing Tibet upwards. Thus Himalayan zone is vulnerable for earthquakes and landslide. Apart from this, floods and avalanches are also common here. The northern plains are affected by devasting floods during monsoon due to flat terrain and torrential rainfall. On the other hand North western part of India and central part of Deccan are mostly affected by drought, famine, at times flash floods and desertification.

The coastal regions of course are affected by cyclones, storm surge and rarely tsunami.

Preparation

1. First step is to strengthen the basic information about the area like landform, slope, climatic features, population, etc.,
2. To list out the types of disaster the area is prone to like earthquake affecting zone, cyclone affecting area and so on.
3. To identify the local area which is most vulnerable to such disaster, for instance, the either side of Adyar river and Velachery are flood prone area within Chennai city.
4. Prepare schemes to deal with the disaster. Example
   a) Identify safe place for the people to be shifted to in case of disaster.

b) Form a volunteer group involving local people with their contact number to coordinate at the time of emergency.

c) Have a list of phone numbers of the nearest Police station, Fire service and Government hospital for immediate correspondence

Response

1. Alert people before the occurrence of disaster.
2. Respond to the grave situation at the time of disaster, example, search, rescue and evacuate all the people from the site of incidence.
3. Arrange the essential items for the people; example food, shelter, medicine and others.
4. Assess the severity of disaster.

Recovery

1. Providing temporary housing facility, medical care, counselling, reuniting people with their kin and kith, financial support, etc.,
2. Rehabilitation and reconstruction of the damaged property.

Mitigation

1. All activities that reduce the impact of the event is said to be mitigation.

Warning systems in India

The Department of Ocean Development in association with Department of Science and Technology(DST), Department of Space(DOS) and CSIR Laboratories, has set up an Early Warning System for Tsunami and Storm Surges in the Indian Ocean. Generation of disaster warning is a multi-institutional effort.

The table gives the Departments responsible for warning the public of the disaster through proper media.

The following are the agencies of disaster management:

Agencies- Disaster Management

Disaster	Agency
Heat wave/ Cold wave/ Cyclone / Earthquake	Indian Meteorological Department (IMD)

Tsunami	Indian National Centre for Oceanic Information System(INCOIS)
Land slides	Geological Survey of India(GSI)
Flood	Central Water Commission(CWC)
Avalanches	Defence Research and Development Organization(DRDO)

Warning systems in Tamil Nadu

Hotline between Indian Meteorological Department and the State Emergency Operation Centre(EOC) is established. Dissemination to the districts is done through telephone and fax. IP phones are also available, which connect the State with the district headquarters, taluks and blocks of the State. Wireless radio network; both high Frequency and very high frequency and very high frequency are available in the State.

Flood:

Sudden overflow of large amount of water caused by heavy rainfall, cyclones, melting of ice, tsunami, etc., is called as flood. Low lying flood plains, coastal plains and river confluences are prone to flood.

Effects of flood:

1. Loss of life and property.
2. Displacement of people.
3. Spread of contagious diseases such as cholera, malaria, etc.,

From 14 to 17 June 2103, the Indian state of Uttarakhand and adjoining areas received about 375% more than the normal rainfall during a normal monsoon. This caused the melting of Chorabari Glacier at the height of 3800 metres, and overflow of the Mandakini River which led to heavy floods near Gobindghat, Kedar Dome, Rudraprayag district, Uttarakhand. The heavy rains resulted in large flash floods and massive landslide. Unscientific development activities undertaken in recent decades

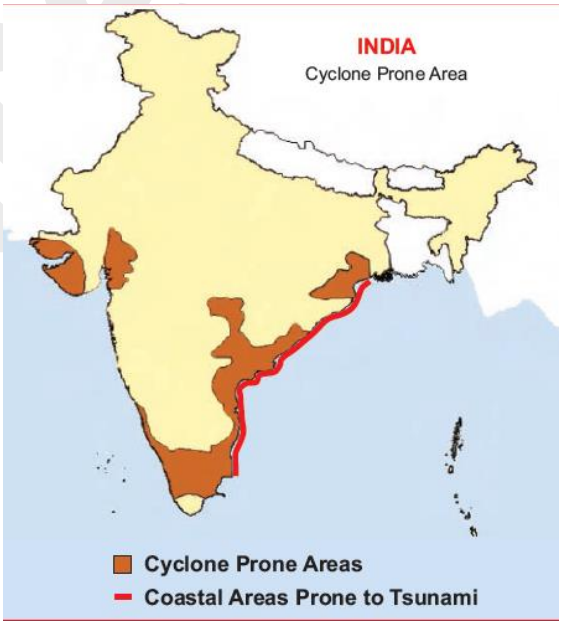
have resulted in high level of loss of property and lives. Roads constructed in haphazard style, new resorts and hotels built on fragile river banks and more than 70 hydroelectric projects in the watersheds of the state led to this disaster.

Cyclone

Areas of low pressure surrounded by high pressure is called as cyclone. It is anticlockwise in Northern hemisphere and clockwise in Southern hemisphere.

- The centre of the cyclone called the eye of the storm is calm and clear without clouds.
- The condensation of vapour releases more latent heat and that gives the energy for the cyclones to enhance further evaporation and formation of clouds.

India with a coast line of 7516 km is affected by 10% of world tropical cyclone. 13 coastal districts of our state are prone to cyclones. Cyclones occur in the month of May – June and in October – November. Cyclones are associated with strong squall, torrential rain, flood and storm surge. The damage by cyclones can be mitigated by growing shelter belts and restoring the mangrove forests where ever possible.



Drought

Long period of rainless weather condition is termed as drought. The severity of the drought depends upon the degree of moisture deficiency, the duration, and the size and location of the affected area.

IMD has taken initiatives to cover all blocks in Tamil Nadu with Automatic Weather Stations Network.

Techniques of conservation of water like sprinkle irrigation, fertigation, pot hole irrigation, precise farming, and selection of suitable variety of crop that can with stand drought are some of the remedies that may reduce the impact of drought.

Earthquake

An earthquake is a sudden vibration or shake of the earth's crust. It is caused by the circulation of the convection cells and the plate movements.

An earth quake may cause the landslide, avalanche, fire, soil liquefaction and Tsunami.

The place of the origin of an earthquake is called **"FOCUS".** The deepest earthquake may have its focus at a depth of even 700km below the ground surface. The place on the ground surface which is perpendicular to the 'focus' is called **'EPICENTRE'.** The seismic waves move away from the source of the earthquake in the form of Primary waves(P Waves) Secondary waves (S Waves) and Long waves or surface waves (L waves).

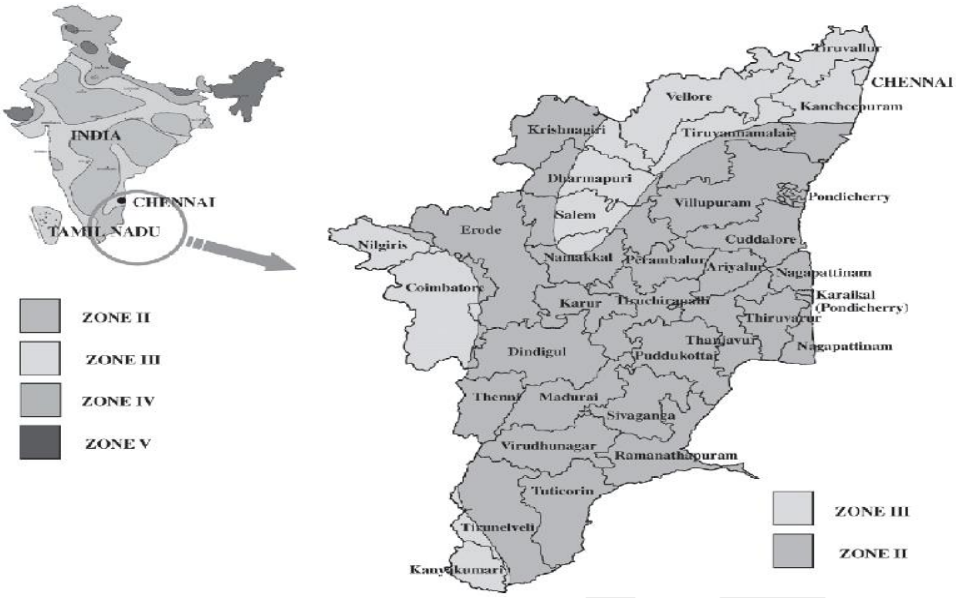
Effects of Earth Quake:

1. Changes in the shape of the earth's surface.
2. Loss of life and property.

Seismic Zones of Tamil Nadu

India is divided into four seismic zones, namely II, III, IV and V; Zone V is the high risk zone. Tamil Nadu falls under moderate and low risk zones.(Zone III and II).

The districts of Nilgiris, Coimbatore, Kanyakumari, Vellore, Thiruvallur, Chennai, Kancheepuram, Thiruvannamalai, Dharmapuri districts are classified as moderate risk Zone III. The rest of the districts in Tamil Nadu comes under low risk zones II.



Tsunami:

An extremely large wave in the sea caused by the earthquake occurring under the ocean floor. Apart from huge loss of life and property the environmental impact of tsunami is tremendous. It affects the quality of fresh water in the coastal aquifers. The salt is deposited on the arable land by sea water and it takes long time to restore the quality of soil.

Facts about tsunami

- An underwater earthquake, a volcano eruption or a landslide mostly causes a tsunami.
- Tsunami can travel as fact as miles per hour, without being noticed and can cross the entire ocean in less than a day.
- When stuck in Tsunami, it is recommended to grab a floating object and allow the current to carry you.
- The tsunami that occurred in December in the Indian Ocean is known to be the most powerful tsunami that has occurred till date.
- Scientists can estimate an almost accurate time as to when and which part is tsunami most likely to occur.

Man Made Disaster

Fire, industrial, technological, transportation, nuclear accidents, biological disaster and war are all man-made disasters.

Fire

Fire is a disaster caused due to electrical short circuit, accidents in chemical factory, match and crackers factory, handling fire by the side of inflammable materials and near gas cylinders are also causing fire. Forest wild fires are a major disaster all over the world.

The environmental impact of forest fire includes emission of large amount of carbon dioxide leading to global warming, loss of bio diversity, affecting hydrological cycle, reducing photo synthetic activity, and health hazards to human beings. Safeguarding life and property from fire and forest fire involves three basic aspects:

1. Prevention 2. Detection and 3. Extinguishing

Public awareness of what to do before fire, during fire and after fire is of critical importance.

Industrial and Technological disasters'

These disasters result from accidents, failures, mishap or misuse of some kind of technology.

The industrial Disaster:

The storage and transportation of various hazardous materials used in industries may result in industrial hazard accidents. Recently, major disaster threats have emerged in the chemical and nuclear industries.

Chemical industry faces multiple risks involved with its production, transportation, storage, usage and disposal off the effluents containing residual chemicals.

Chernobyl nuclear disaster 1986 (former USSR) and Japan, 2011 had experienced the most hazardous nuclear disaster.

General survival techniques

- During flood forecast it is important to stock up on first aid items, non-perishable foods, 3 gallons of water per person for 3 days, battery operated radio for weather reports, extra batteries, personal hygiene necessities. Secure the cattle's in an elevated place and store their fodder and

potable water. Listen to the local Radio/ TV for instructions. Cut off all the electrical supply during flood and earthquake.

- During drought period arrange fodder and drinking water for cattle in drought regions. Form hazard and risk management service groups and function effectively as per the advice of scientific community in each village.
- During the earthquake be under the table, chair, kneel to the floor and protect yourself. Go near a sturdy wall, sit on the floor and hold the floor strongly and protect yourself. Use only torch lights, avoid candles and oil lamps because of fire risk, where earthquake occurred. Wear sandals while walking on rubbles.
- In case of fire accident Call the nearby police station, (No. 100) or the fire service(No.101) as soon as the firebreak. If caught in a fire or smoke, escape by crawling low to the floor. If clothes are on fire, "Don't Run; Stop, Drop and Roll".
- In case of Industrial hazards previous knowledge of every aspect of the chemical involved will help us to act promptly to mitigate the disaster. Know the safety measures and follow the rules strictly. Handle the chemicals with care,
- Road accidents can be avoided if only legal licensed person above 18 is allowed to drive. Learn, preach, and practise safety rules during driving and walking along the road.
- At railway crossings pay attention to signal and the swing barrier. In case of unmanned crossing, get down from the vehicle and look at both the sides of the track before crossing the track. Don't touch objects which are suspicious. Never jump from a moving train.
- On boarding the aircraft pay attention to the flight crew safety demonstration. Carefully read the safety briefing card available in the seat pocket.

winmeen.com

8. Tamil Nadu – Trade

Trade is an important phenomenon that decides the economic growth of a country. The types of goods and services that a country exports and imports provide a mirror image of the economic structure. Trade may be defined as "an exchange of goods and commodities either within the country or between countries". In simple terms, buying and selling of commodities is called trade and it may be local, regional, national and international. The primitive method of trade was known as the **barter system** where goods were exchanged for goods. Later on, money was introduced as a medium of exchange in buying and selling of goods.

Exports refer to goods and services sold for foreign currency. A country which increases its export transactions is said to accumulate foreign exchange reserves.

Major Exports of Tamil Nadu

1. Textile goods
2. Drugs and pharmaceuticals
3. Chemicals
4. Leather and leather goods
5. Engineering goods
6. Ores and minerals
7. Software and electronics

Imports are goods and services bought from overseas producers. Almost every country of the world will try to pay for their imports through exports. Trade is not a mere exchange of goods; but it also includes exchange of service.

Major imports of Tamil Nadu

1. Minerals fuel and mineral oil
2. Electrical machinery equipment and spare parts.
3. Iron and steel and articles of iron and steel
4. Natural and cultured pearls
5. Organic chemicals

6. Plastics and articles
7. Vegetable fats and oil products

Trade is of two types: 1. Internal Trade and 2. International Trade

Internal trade

Trade carried on within the domestic territory of a country is termed as internal trade. Roadways and railways play an important role in the internal trade. In this type of trade, the national currency is involved to carry on the trade.

International Trade

Trade between two or more than two countries is termed as international trade. If the trade is between two countries, it is bilateral. There is also multi-lateral trade which occurs among more than two countries. Multinational currencies are used to carry on this type of trade. Ports and harbours play an important role in international trade.

Trade in Tamil Nadu

As Tamil Nadu has well developed roadways and railways, domestic trade is efficiently handled among the districts of Tamil Nadu.

For marketing the commodities, in the state, there are several Market Committees and regulated markets, functioning in all the districts of Tamil Nadu. Market Committees are formed by the nominated members of the beneficiaries and the Chairperson for the committee is selected by the members. There are about 21 market Committees to handle the marketing of agricultural goods and to fix a genuine prices for the commodity. At present there are about 303 **Agricultural Produce Marketing Centres (APMC)** distributed all over the districts of Tamil Nadu. The APMC is further classified into Primary, Secondary marketing centers and non-regulated marketing centers (Agmarknet statistics 2010). The largest number of 34 Marketing centers are found in Erode district followed by Coimbatore and Thanjavur with 21 centers.

Uzhavar Sandhai scheme was initiated for direct selling of fruits & vegetables at a fair price by the farmers to the consumers without any intermediaries. The 1st Uzhavar Sandhai was started

at Madurai in 1999 and there are about 103 such Uzhavar Sandhais in the state. Every day on an average 1609 MT of fruits and vegetables worth of Rs.191.77 lakhs are sold by 7526 farmers 2,71,685 consumers were benefited through Uzhavar Sandhais during the year 2008-2009.

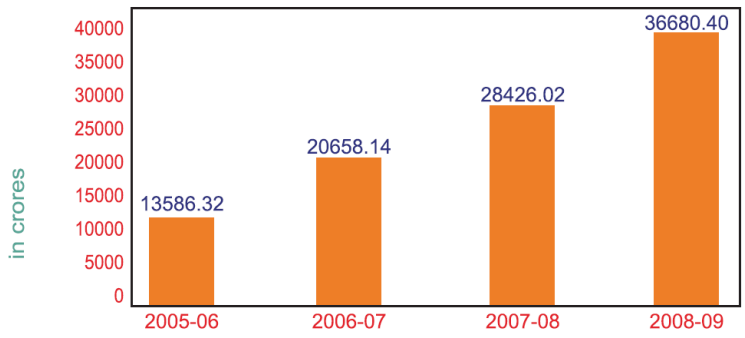
Market Complexes with storage facility are available all over the state.

Tamil Nadu Co-operative Silk Producers Federation, TANSILK an apex co-operative body, with Headquarters at Kancheepuram, purchases raw silk and supplies them to Handloom Weavers Co-operative Societies and other weaving sectors.

Industrial Co-operatives, a wing of the Department of Industries and Commerce, Government of Tamil Nadu in arranging to the market the products of rural artisans through Handicrafts Co-operative Societies. State Industries Promotion Corporation of Tamil Nadu(SIPCOT) focuses on developing, marketing and maintaining industrial complexes/ parks within the state.

The exports of Tamil Nadu has been increasing at faster rate than the overall exports of the country. The significant rise information Technology (IT) companies in Tamil Nadu has promoted the value of software export in recent years. The following are the value of software products sent abroad.

Tamil Nadu - Major Exports 2005-2009 value in Rupees



Year	Exports (Rs. in million)
2007/08	284,260
2009/09	366,800
Foreign Trade(Rs. in million)	
Export	
By Sea	602,600
By air	74,990
Import	
By sea	1,285,400
By air	304,950

Importance of Trade

Trade is called an engine of growth because:

1. It helps in the increase of foreign currency reserve.
2. It makes available all kinds of goods anywhere.
3. Trade increases technology transfer from one country to another.
4. It improves the welfare of the workers.
5. It helps to increase the total production of an country.

9. Tamil Nadu – Population

People of a country are the greatest assets for development. People living in an area together are known as population. The study of population is known as demography. People are considered as resources because of their ability to change available natural resources into value added products. Human potential, knowledge and energy are used for the betterment of individuals, the society and the nation. Every individual contributes to the nation's development. Therefore, the size of population and its individual capacity in terms of education, health and work force decides the pace of national development. For this reason, people of the country should be nurtured in proper manner to maintain the quality and quantity.

Population of Tamil Nadu

As per 2011 Census, the population of Tamil Nadu was about 7,21,38,958 of which 3,61,58,871 was males and 3,59,80,087 was females. Tamil Nadu as a whole has 5.96% of the total national population (India).

The Census of India, a central governmental organization, is engaged in collecting, tabukating and publishing all statistics related to population, once in ten years.

Demography indices

The **crude birth rate –** the annual number of live births per 1,000 people.

The **crude death rate –** the annual number of deaths per 1,000 people.

The **infant mortality rate** – the annual number of deaths of children less than 1 year old per 1,000 live births.

The **sex ratio-**the number of females per 1,000 of males.

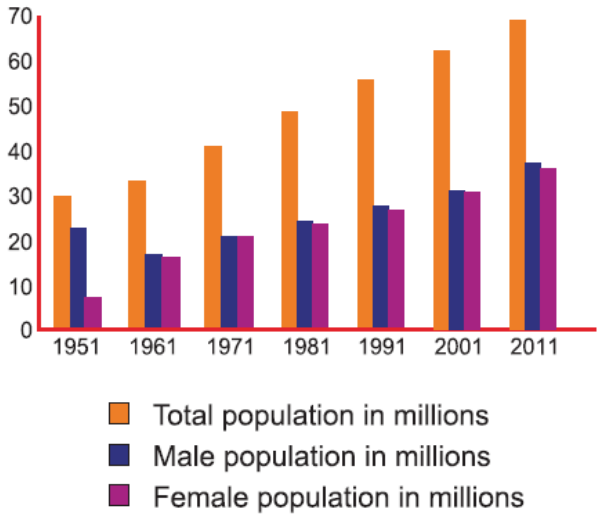
Life expectancy –the number of years an individual at a given age would be expected to live at present mortality levels.

Total fertility rate represents the numbers of children that would be born to a woman if she were to live to the end of her childbearing years and bear children in accordance with current age-specific fertility rates. The Total Fertility Rate of Tamil Nadu.

Birth and death rates for Tamil Nadu for the year 2006 is 15.9 and 7.6 per thousand population, respectively. Infant mortality rate has reached 37 to 1,000 live births by 2006.

Growth of population

From the bar diagram given, may be inferred that the population of Tamil Nadu has doubled over a period of 60 years from 1951 to 2011.



The difference between birth and death rates gives the natural increase of population of regions. When expressed in percentage it is known as the growth rate. The annual growth rate is 1.1%, which is lower than that of India.

When birth rate is continuously high, a nation has to provide education and health facilities for more number of children. Other environmental problems also increase with high population. Tamil Nadu has shown a considerable rate of reduction in growth rate in recent years.

Distribution of population

Chennai possesses the largest share of 6.4% of the total population of Tamil Nadu. This is followed by Coimbatore, Vellore and Salem districts. Perambalur has the least population of (0.078%).

Factors influencing the distribution of population

- Generally, plains with suitable climate support a huge population.

- Coastal plains with mild temperatures and good opportunities for economic activities support huge population.
- Job opportunities in large towns and cities attract both literates as well as illiterates.
- Dry regions generally support a small population.
- Mountainous regions with steep slopesn and forest cover support a small population as well.

In general, the variations in population among different regions are identified by **population density.** Density of population is a means of finding out the number of persons living in one unit area, which is generally expressed as persons per square kilometer. It gives an idea of how crowed a region is. The following table gives the density of population in Tamil Nadu, by districts of the states.

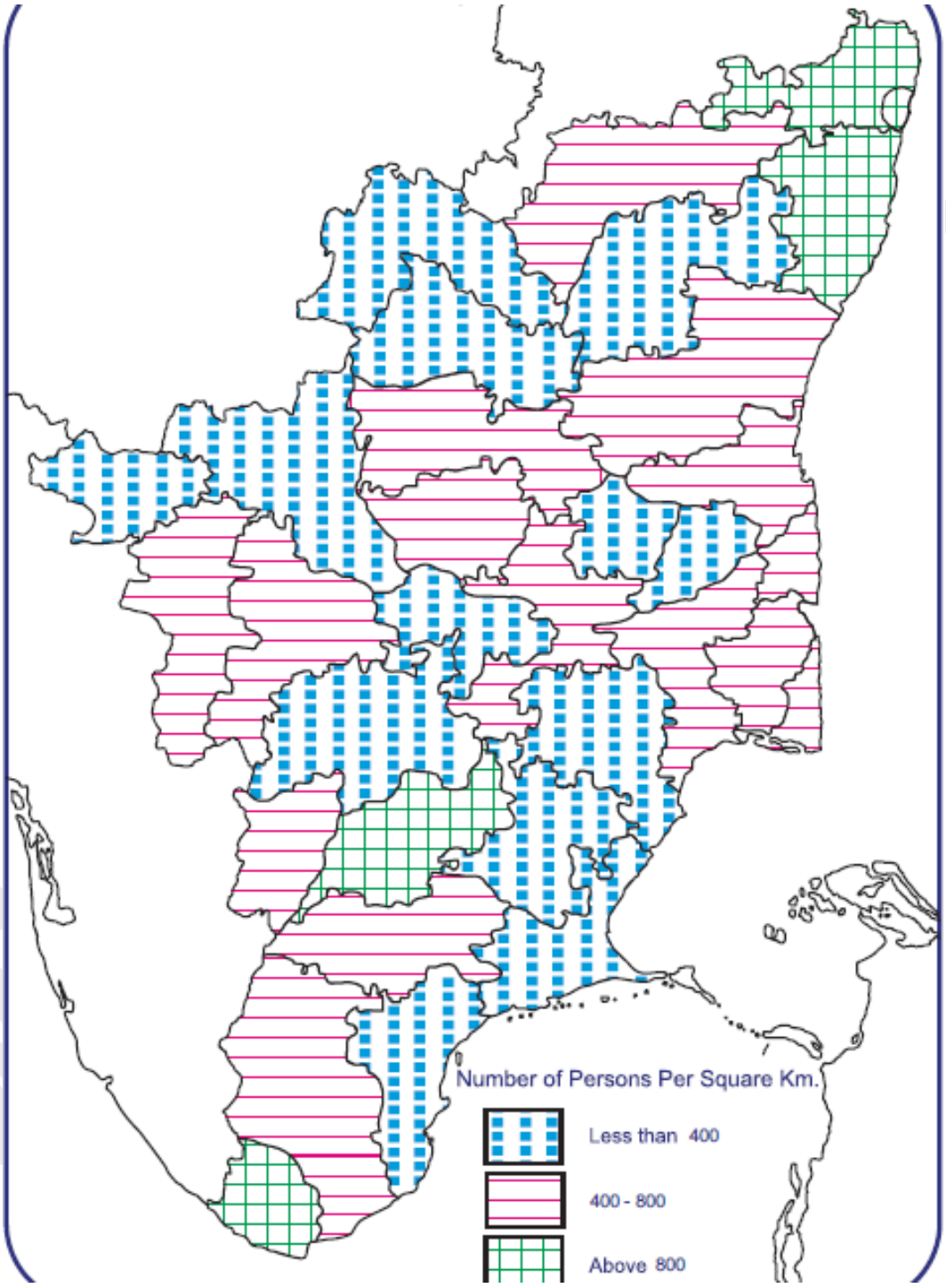
Table: Tamil Nadu: District wise density of population

Number of persons per square km	**Density**	**Districts (density is given in brackets)**
Less than 400	Low	Nilgiris(288), Ramanathapuram(320), Perambalur(323), Sivagangai(324), Dharmapuri(332), Pudukkottai(348), Dindigul(357), Krishnagiri(370), Karur(371), Thuthukkudi(378), Ariyalur(317), Erode(397), Thiruvannamalai(399)
400 – 800	Medium	Theni (433), Virudhunagar(454), Tirunelveli(458), Tiruppur(476), Villupuram(482), Namakkal(506), Thiruvarur(533), Tiruchirappalli(602), Vellore(646), Salem(663), Nagapattinam(668), Thanjavur(691), Cuddalore(702), Coimbatore(748).
Above 800	High	Madurai(823), Kancheepuram(927), Thiruvallur(1049), Kanniyakumari(1106), Chennai(26903).

From the table, it may be understood that eight districts exhibited high population density. Seventeen districts have medium densities and five districts fall under low population density.

Chennai, the capital city, a centre for administration, education, industry, trade, commerce and recreation, has the highest density of population. Sivagangai has the lowest density of population.

Tamil Nadu Population Density



Composition of Population in Tamil Nadu

As per 2011 census, 37% of population in Tamil Nadu is below 20 years, 54% is between 20 and 60 years, and 9% is above 60 years.

Percentage of Schedule Castes and Schedule Tribes is 20% and 1.1% respectively.

In Tamil Nadu there are about 88% Hindus, 5.5% Muslims, 6% Christians and the rest are of religions such as Sikhs, Buddhist and Jains.

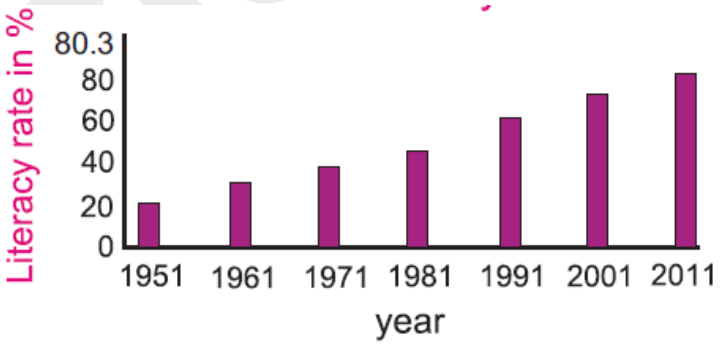
The state has a sex ratio of 996 women for 1000 men. The highest sex ratio is in Thuthukodi(1042) and the least is in Dharmapuri(946). Fifteen districts record more females than males.

In Tamil Nadu, 51.55% of the people live in rural areas and 48.45% of the population live in urban centres.

Literacy

The literacy in Tamil Nadu has greatly increased in the period 1951 to 2011. The overall literacy of Tamil Nadu is 80.09% Among the districts, Dharmapuri has the least literacy of 68.5% . Kanyakumari has the highest 91.75% of literates. Chennai, Thuthukudi and the Nilgris have 80% literates. Among the Schedule Castes and Schedule Tribes 55% and 35% of them are literates.

Tamil Nadu – Literacy rate



The state has considerably reduced the school dropouts. Education for all is the prime ambition of the government. Among men, 726 out of every 1000 are literates. Likewise among women 571 out of every 1000 are literates. Among the districts, Kanyakumari has the highest literacy rate with 803 for every thousand men and 758 for every thousand women.

Occupation

According to 2011 Census, the total number of workers in Tamil Nadu account for 44.67%; non-workers accounts for 55.33%. Among the workers, 41.5% work in the primary sector, followed by 27.7% in the secondary sector and 30.8% in the tertiary sector.

Classification of workers

It may be noticed from the table that agricultural workers are seen to, be reducing in number. Construction workers and tertiary workers are increasing year after year which indicates the trend of increasing urbanization in Tamil Nadu. In the year 2000, the unemployment rate for the state was 2.4%.

Tamil Nadu workers and Non-workers

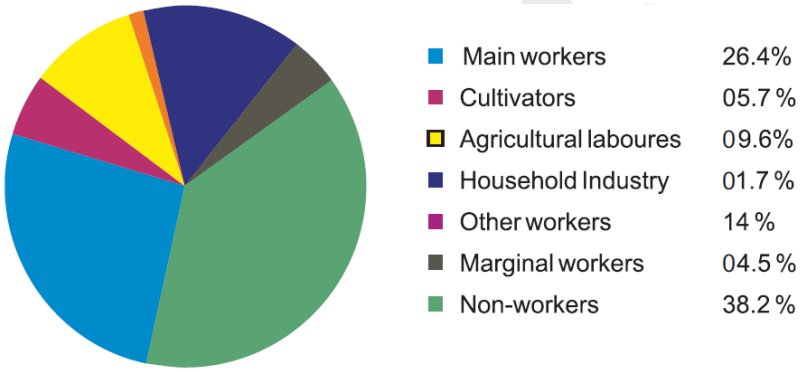


Table: Classification of Workers and Distribution

Workers	1961 (in%)	1991(in %)	2001(in %)
Cultivators	42.0	25.0	18.4
Agricultural labourers	18.4	36.0	31.1
Household, Industry, Manufacturing	13.4	03.6	05.3
Other workers	26.2	35.0	45.2

Source: Tamil Nadu Human Development Report.

Women Development and their contribution to Economy

The potential of women should be realized and recognized for the well- being of any society and development of the nation. Tamil Nadu is a pioneer state which has encouraged the empowerment of women.

Former UN Secretary General Kofi Annan has stated: "Gender equality is more than a goal in itself. It is a precondition for meeting the challenge of reducing poverty, promoting sustainable development and building good governance".

Women empowerment includes:

- Women's sense of self-worth
- Right to seek and decide upon choices;
- Right to have access to opportunities and resources; and
- Right to have control on their lives both within and outside of their homes.

Strategies Adopted by Government of Tamil Nadu for Women Empowerment

Tamil Nadu Government has implemented several welfare schemes for women empowerment.

In order to empower women, the Science City has been organizing Entrepreneurship Development Programme(EDP) and Entrepreneurship Awareness Programme(EAP) to bring out the talents of women and to make them prove their potential.

A Self – Help Group(SHG) is a group of women, organized for eradication of poverty. They agree to save regularly and convert their savings into a common fund known as the Group Corpus. The members of the group use this common fund through a common management. In Tamil Nadu the SHGs were started in 1989 in Dharmapuri district. At present 1,40,000 groups are functioning with 2.383 million members. Tamil Nadu Corporation for Development of Women Ltd arranges credit assistance for the successful groups through various schemes implemented by State as well as Central Government. Tamil Nadu ranks first in witnessing economic well-being of the people involved in such SHGs.

Human resource management

Since human resources are the most valuable of the resources of the earth, the people must be carefully managed so that everyone on the earth live peacefully. Human resource management aims at developing personal qualities in an individual so that he or she may contribute in a healthier manner for the national and world peace.

10. Environmental Issues

Man and Environment

Development and environment are the two sides of a coin. Development highly essential for economic growth of a country but not at the cost of the environment. Man has lived continuously in harmony with nature. Man has transformed the environment by scientific and technological revolution. In recent years human intervention in the natural process has created ecological imbalance and environmental damages. Environment is the surrounding in which living organisms live and interact. Human beings are dependant on the environment for their basic needs. Needs multiply with the increase of population. To meet these needs, all natural resources in the environment are being used at a rapid rate which leads to long term adverse effect. These adverse effects become environmental issues of the entire surrounding in which human beings live.

Major environmental issues are:

- Urbanization
- Deforestation
- Environmental pollution and
- Global warming

Urbanization

It refers to increasing inhabitants of people with non-agricultural occupation with a higher population density than the surrounding regions. The factors influencing urbanization are, industrialization, commercialization, dense network of transport and communication. The level of urbanization in Tamil Nadu is about 44% as per census of 2001. It is the second highest urbanized State in the country. In Tamil Nadu, Sriperumpudur, Kancheepuram and Arakonam are being urbanized due to rapid industrialization and nearness to the Chennai City and due to this they face higher rate of environmental deterioration.

Unorganized encroachment and uncontrolled growth of slums that spring up on all available chunks of vacant lands, river margins and road margins have created an adverse impact

on urban environment. The Tamil Nadu Slum Clearance Board has already taken steps and constructed nearly 3000 shelter units to replace the existing slums.

Table: Slum families along Major Waterways

Name of the river	No of slum families
Coovum River	8266
Buckingham Canal	18423
Adyar River	6624

Source: Census 2001

Notable impacts of urbanization

- Large areas of agricultural and pastoral lands around the City are getting converted into residential and industrial areas.
- Increase in traffic and traffic congestion cause environmental pollution.
- Clearance of trees and bushes to meet the fuel and construction needs has reduced the green cover which in turn reduces the amount of rainfall.
- Loss of habitats of animals and birds and depletion of greenery has made the urban air polluted with less oxygen content.
- A rapid increase in the urban population has resulted in the breaking down of sanitary facilities and other infrastructures in cities and towns.
- Land value increases and rent becomes high due to stiff competition for land.

Deforestation

Deforestation is simply the cutting down of trees. It has serious affected the quality for environment by increasing the temperature, decreasing rainfall, top soil erosion, loss of bio-diversity and causes flash floods. Trees play an important role in maintaining the environmental balance.

Long term effects of Deforestation

- The long term effects are climate change and loss of bio-diversity. Climate change occurs due to an increase of green houses gases such as carbon dioxide. An increase in carbon dioxide will increase the temperature of the earth and will therefore alter the weather.

Deforestation ruins the habitat of the animals and plants causing them to die. Destruction of forest affect the beauty of an area and directly exerts an impact on tourism.

Short term effects of Deforestation

Fast depletion of forests urges rural people to use inferior quality firewood and make them spend more time on fuel collection. Shortage of forests also force the villagers to use more commercial fertilizers in the place of organic manures. Fodder for grazing cattle diminishes resulting in decreasing number of live stock. Loss of green cover leads to soil erosion. Landslides occur due to in discriminate cutting of trees(Ooty and Coonoor).

Bio Diversity

A wide variety of living organisms including plants, animals and micro organisms are collectively referred to as bio diversity.

Today, human beings are largely to be blamed for irrational activities that cause bio diversity losses.

Loss of Bio Diversity

Extinction of plants and animals due to natural causes or human activities is called loss of bio diversity. It leads to an ecological imbalance.Major threats to biodiversity in Tamil Nadu are:

- Uncontrolled commercial exploitation of natural resources like forest, coastal areas, wetlands and habitat destruction.
- Conversion of rich bio diversity sites for human settlements and industrial development.

To protect the biosphere, biosphere reserves have been set up in the Nilgiris and Gulf of Mannar.

The main objectives of the reserves are:

1. To conserve the genetic diversity of species and to restore degraded ecosystems to their natural and original conditions.

2. These natural reserves are alternatives for the sustainable growth of species.

Common household items derived from killing animals:

1. Paint brush – from wild boar and mangoose
2. To produce 100 gm of silk – about 1500 silkworms are boiled to death
3. Silver foil – Ox-gut is used (intestine)
4. Lac – To produce 1 kg. of lac 300,000 insects are killed.

Global Warming

Global Warming may be defined as an increase in the atmospheric temperature near the earth surface due to rise in carbon dioxide levels and the greenhouse effect.

Causes of Global Warming

The main causes of Global Warming are,

- Emission of greenhouse gases like carbon di-oxide, methane, nitrus oxide and choloro fluro carbon.
- Burning of fossil fuels(coal and petro;eum) and aggravated deforestation.

Effects of Global Warming

1. Heat waves and fluctuating weather cause diseases and warming up of Antarctic and Arctic oceans.
2. Sea level rise and coastal flooding due to glaciers' melting.
3. Coral reef bleaching due to to change in ecosystem.
4. Frequent drought, fire and heavy snowfall.

Control of Global Warming

A few controlling measures are:

- Switching over from non-renewable energy sources to renewable energy.
- Stopping the emission of greenhouse gases.
- Afforestation and encouraging people to use public transport.

Role of man in protecting the deteriorating environment

It is now the duty of every citizen of the world to conserve all the resources and aim at sustainable development. Human beings need to change their lifestyle and realize that they should take special responsibility towards protection of the encironment. The following are the steps to be taken for protecting our green earth from degradation.

- Maintaining harmony with the nature and protecting the environment
- Eco-development eco-efficiency and eco-friendly technology for the protection of natural resources.
- Switching off the unused lights and electrical equipment at home and save fuel in transport.
- Stabilizing the population growth, control of overconsumption of natural resources and preservation of bio-diversity.

Pollution

Substances released into an environment that cause harm to living organisms and built up structures are called pollution Any substance that causes pollution is called pollutant. Pollutants are of two types: chemical and biotic. Our planet is getting choked with poisonous gases released from industries and vehicles. The problem is worse in crowed metropolitan cities. On the basis of sources, they are classified as

1) Air pollution;
2) Water pollution; and
3) Noise pollution

Air pollution

Air is polluted by the harmful gases released from industries and vehicles. Pollutants such as Co_2, Co_2 which cause air to be polluted.

Air is pollution causes health hazards like respiratory infection and lung cancer.

Chief sources of air pollution

1. Industrial wastes;
2. Automobiles;
3. Domestic wastes;
4. Thermo-nuclear wastes;
5. Volcanic wastes an forest fires.

In Tamil Nadu air pollution is heavy and widespread in urban areas due to vehicular growth, higher concentration of industries along with thermal power plants and indiscriminate burning of garbage and reuse.

Effects of air pollution

1) Global warming;
2) Acid rain;
3) Ozone depletion;
4) Smog; and
5) Health problems

Water Pollution

Contamination of water is due to pollutants released from

1. Sewage and domestic wastes.
2. Pesticides and agricultural run offs;
3. Industrial wastes;
4. Nuclear wastes;
5. Oil spills

Harmful effects of water pollution

1) It destroys microorganisms in water and affects aquatic life.
2) It causes water borne diseases such as cholera, jaundice, dysentery and typhoid.
3) Damages crops, decreases agricultural production due to deterioration of soil quality and fertility.
4) Oil spill results in death of sea organisms.

River Pollution in Tamil Nadu

Most of the rivers of Tamil Nadu are non-perennial in nature. Due to irregular supply of water the rivers are mostly used to carry effluents of tanneries, textile bleaching, dyeing and hospital wastes.

The indiscriminate discharge of effluents from textile bleaching and dyeing units in and around Tiruppur, erode and Karur areas have caused pollution in the river system of Noyyil and Amaravathi. Effluents from tanneries is the main reason for land quality deterioration in the Palar river basin of Vellore district. Most towns located along the banks of four major rivers cause sewage pollution. The Kaveri river receives sewage from 11 towns, Palar from 6 towns, Vaigai from 5 towns and Tamiravaruni from 3 towns.

The Government imposed a total ban on setting close to important water sources such as the Kaveri and its tributaries, Ponnaiar, Palar, Vaigai and Tamiravaruni. Tamil Nadu Pollution Control Board(TNPCB) has set up a special monitoring the highly polluting industries. Ooty, Kodaikkana; and Yercad lakes are monitored by GEMS(Global Environment Monitoring System). Chennai City River Conservation Project has taken up Cooum River Buckingham Canal, Adyar River, Otteri Nallah and Mamblam Canal for cleaning up.

Soil and land pollution

Land pollution is the contamination of land by solid wastes. Any substance that reduces the productivity of the soil and lessens the quality is known as a soil pollutant and the process is known as soil pollution.

Sources of soil and land pollution

Land pollution is caused due to dumping and accumulation of solid wastes from agricultural, industrial and urban sources.

The excessive use of artificial fertilizers and pesticides greatly reduce the quality and fertility of the soils.

Table: Solid wastes generated in major cities of Tamil Nadu

City	Tons/Day
Chennai	3500
Madurai	711
Coimbatore	710
Trichy	408
Salem	330
Tirunelveli	210

Effects of soil pollution

Harmful chemicals enter food chain and cause harmful diseases. Pesticides affect the central nervous system, liver and damage reproductive organs.

Noise pollution

Noise can be defined as the unwanted and undesirable sound. Noise pollution is severe in the industrialized, urbanized and thickly populated regions of Tamil Nadu. Ambient noise level in Chennai is about 75-80 decibels, Coimbatore 80-85 decibels and Madurai 70-75 decibels.

Harmful effects of noise pollution

1) It causes loss of hearing, headache, mental disorder, anxiety and stress.
2) Excessive noise causes vibration in buildings.
3) Disturbs sleep which leads to irritability and nervous disorder.
4) The fertility of living organisms gets reduced considerably due to noise pollution.

Measures taken by the Government to protect and preserve the environment

1) Rehabilitation and reclamation of forest resources through afforestation.
2) National Green Crops: it is mainly to strengthen environmental awareness among school children. The programme was launched in 29 district. Under the scheme, the Government of India provides the grant of Rs. 1000 to every school annually. Nearly 3 lakh children are participating in this programme.
3) Environmental awareness camps, competition and eco-celebration.

Special days like World Environment Day(June 5), Earth Day(April 22), Ozone Day (September 16) are celebrated every year.

4) Segregating solid wastes into different types on the basis of degradation through waste management.
5) Electronic Waste Management

The increasing pace of IT and Electronic industries generate 70% of e-wastes and should be disposed through the authorized recyclers as approved by the TNPCB.

6) In order to control the emission from goods transport vehicles, vehicle emission monitoring stations are lset up in Chennai by the TNPCB at Alandur, Madhavaram and Ambattur areas and in the other districts at Nilgris, Dindigul, Palani and Chengalpet. Three monitoring stations have been established at guindy, Vyasarpadi and Thirumangalam in Chennai to check vehicular emission. There are 46 air pollution monitoring stations in the city of Chennai.
7) To create Singara Chennai, parks, flyovers, bridges, modernization of beaches and relaying of footpaths and roads, besides clearing encroachments have been undertaken.

House Sparrows are not found now-a-days to electromagnetic waves from mobile towers.

Tiger population is going down rapidly due to poaching.