

CHENNAI DISTRICT

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1. Introduction

i) Geographical location of the district

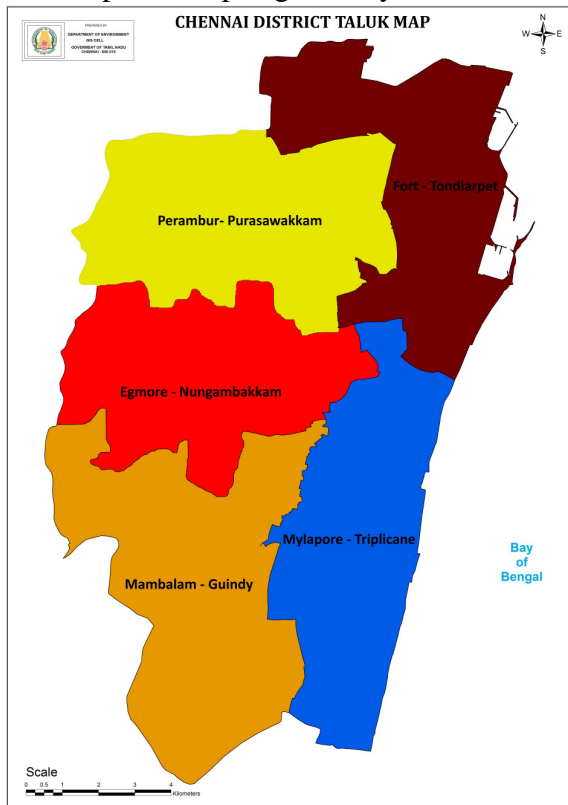
Chennai is situated in the North-Eastern end of Tamil Nadu on the coast of Bay of Bengal. It lies between 12° 9' and 13° 9' North and 80° 12' and 80° 19' East. The total area of the district is 178.2 sq.km. It is bounded by the Bay of Bengal in the east and on the remaining three sides by Kancheepuram and Tiruvallur districts. The topography of the district is almost flat and the ground level in the district slightly rises up to 22 ft above the mean sea level.

Chennai has a long beach, which stretches nearly 25.60 km from Thiruvottiyur in the north to Thiruvanmiyur in the south and it is sandy for about a km from the shore. The bed of the sea is about 42' deep and slopes gradually for a distance

of about 5 km from the coast and attains a depth of about 63'. The two principal currents, one from the north sets in about the middle of October and continues till February and another from the south flows parallel to the coast, which starts during the early days of August and continues till the middle of October.

ii) Administrative profile

Chennai City is one of the oldest cities of India. Chennai district encompasses the entire Chennai Corporation including 19 villages added in the year 1979 from the Chengalpattu district. The following table shows the administrative profile of the district.



Taluk Name	No. of Villages
Egmore - Nungambakkam	13
Mylapore - Triplicane	8
Mambalam - Guindy	15
Fort - Tondiarpet	7
Perambur - Purasawakkam	12

ii) Meteorological information

Chennai has a tropical wet and dry climate. The city lies on the thermal equator and is also on the coast, which prevents extreme variation in seasonal temperature. The weather is hot and humid for most of the year. The hottest part of the year is late May to early June, known regionally as Agni Nakshatram ("fire star")

or as Kathiri Veyyil, with maximum temperatures around 35–40 °C (95–104 °F). The coolest part of the year is January, with minimum temperatures around 15–22 °C (59–72 °F). The lowest temperature recorded is 13.8 °C (56.8 °F) and the highest recorded temperature is 45 °C (113 °F). The average annual rainfall is about 140 cm (55 inches). The city gets most of its seasonal rainfall during the northeast monsoon period from mid–October to mid–December. Cyclones in the Bay of Bengal sometimes hit the city. The highest annual rainfall recorded is 257 cm (101 inches) in 2005. Prevailing winds in Chennai are usually south-westerly between April and October and north-easterly during the rest of the year. Historically, Chennai has relied on annual monsoon rains to replenish water reservoirs, as no major rivers flow through the area. Chennai has a water table at 2 m for 60 % of the year.

2. Resources availability

i) Land resources

The total geographical area of Chennai District is around 17,400 ha. The urban nature of the district indicates that there are no activities being carried out with respect to Agriculture and Horticulture. Therefore, data pertaining to agriculture, horticulture practices, soil types, soil problems; soil conservation works are not applicable to Chennai districts.

iii) Agriculture and horticulture

Chennai city today is devoid of any typical agriculture areas but can still be proud of some of the well maintained green belts found in the Peoples park, the Napier park, the Horticulture-gardens, My Lady's Park, Children's Park Guindy, Snake Park, Nehru Park, Nageswara Rao Park, Independence Park, Anna Square Park, the Raj Bhavan, the Theosophical Society

Campus and a number of bungalows and newly developed colonies where provisions for public parks, etc. have been made.

The indigenous trees found are *Azadirachta indica*, *Mangifera indica*, *Tamarindus indica*, *Albizia saman*, *Albizia lebbek*, *Ficus benghalensis*, *Cocos nucifera* and *Ficus religiosa*. Stretches of casuarina plantations are available on the sea-coast beyond the mouth of the Adyar river in the South and Tondiarpet in the North.

iv) Forest resources

Chennai district is not endowed with many forest resources except the Guindy National Park with an area of 270.57 ha which is under Reserve Forest category. In terms of density of vegetation cover, the area falls under sparse category. The Guindy National Park is classified under tropical dry evergreen forests of the Coromandal coast and is being used for recreational purposes. However, much of this park area represents dry deciduous scrub jungle of the Southern dry zone interspersed with more than 30 species of trees. The entire vegetation looks dry during summer months, but trees acquire a verdant look with the onset of monsoons. The forests are interspersed with open grassland, which is the ideal habitat for black bucks. Besides the terrestrial vegetation different water plants are seen in the lakes and ponds inside the park.

v) Water resources

Rivers

The city is intersected by two rivers, the Cooum and the Adyar. Cooum runs through the heart of the city and enters the sea between the University buildings and the Fort St. George underneath the Napier Bridge, while the latter wends its way through the Southern part of the city and enters the sea near Adyar. These two rivers

are almost stagnant and do not carry enough water except during rainy seasons.

Cooum river starts from Kesavaram Anicut in Kesavaram village built across Kosasthalaiyar River. The surplus from Cooum tank joins this course at about 8 km, lower down and this point is actually the head of Cooum river which is located 48 km, west of Chennai. The river receives a sizeable quantity of sewage from its neighbourhood. Though the river Adyar can be traced to a point near Guduvancheri village, it assumes the appearance of a stream only after it receives the surplus water from the Chembarambakkam tank. The river has no commercial importance, but the fishermen in the neighbourhood make their living by fishing in the river.

Canals

The Buckingham canal which runs through the States of Tamil Nadu and Andhra Pradesh is a navigation canal. This canal runs almost parallel to the Coromandal coast within the limits of 5 km from the coast. It joins up a series of natural backwaters and connects all the coastal districts from Guntur to Cuddalore. Entering the city at Tondiarpet in the north and running along the western outskirts of George Town, it joins the new canal, south-west of General Hospital. The other canal worth mentioning in the city is the Otteri Nullah which commences from the village Mullam, runs eastwards upto Purasawalkam and then passes through Buckingham and Carnatic Mills and finally joins the Buckingham Canal, north of Basin Bridge Railway Station.

Chennai has 25.6 km of sea coast which is flat and sandy for about a km from the shore. The bed of the sea is about 42' deep and slopes further in gradual stages for a distance of about 5 km from the coast attaining a depth of about 63'. The two

principal currents, first from the north and second from the south flow parallel to the coast. The former sets in about the middle of October and continues till February while the latter starts by about August and continues till the burst of the northeast monsoon in the middle of October. These two principal currents are caused by the winds.

vi) Fisheries production

Chennai has 25.6 km long coastline and is one of the major fishing centres in Tamil Nadu with nearly 44 villages engaged in fishing activity in and around the district.

- a). Total coastal line of the district : 19 km
- b).i. Total inland fresh water spread
 - area : 240 ha
 - ii. Estuaries and brackish
 - water area : 40 ha
- c). Marine fishing villages : 44

Fish Production: Item Quantity Value (Item) (tonne) (Rs.in lakh)

	(1)	(2)	(3)
Inland	NIL	NIL	NIL

Fisheries Development

- Marine Inland 14031 7576.74
- a) Freezing Plants : 1.5 tonnes capacity run by T.N.F.D.C.
- b) Iceplants, Cold storages : 5.0 tonnes
Capacity Ice Plants run by T.N.F.D.C.
And walk in coolers : -Nil-
- c) Sea food processing : -Nil-
Units in private sector : -Nil-
- d) Fisheries Training centre :
 - i. Marine : -Nil-
 - ii. Inland : -Nil-
- e) Fishing Vessels Mechanised : 1229
- f) Active Marine Fishermen : 16299
- g) Active Marine Fishermen : 4279

Export

Fish and Fish Products:

- a) Quantity (tonne) : 42246 MTs
- b) Value (Rs.in crore) : 1382.55 crore

vii) Heritage sites

The protected and conserved monuments in Chennai district include St. George Fort, Egmore Museum, Parthasarathy Temple, Kapaleeswarar Temple, High Court, Madras University, Thousandlight Mosques, St.Thomas Mount, Triplicane Mosque, Theosophical Society, Adyar etc. These monuments are maintained by Archaeological Survey of India (ASI).

The major tourist area in the district includes Fort St. George, which was built in 1653, as a trading centre by the British East India Company. At present a portion of the fort is used to accommodate the Legislature and the Secretariat of the Government of Tamil Nadu. Within the Fort St. George, St Mary's church was built in 1680, which is considered as historically the most important building, and Fort Museum, which preserves most remarkable treasures relating to history of British Empire in Chennai District.

In addition Valluvarkottam, Marina beach, Guindy Children's park area, Government Museum at Egmore, also attract both domestic and international tourists. Among the many attractions of Chennai, the two ancient shrines of Sri Kapaleeswarar Temple in Mylapore and Sri Parthasarathy Temple in Triplicane also tourist attract. .

Maximum numbers of domestic tourists are visit Parthasarathy Temple, Marina Beach, Valluvarkottam, Guindy Park, Crocodile Park and Gandhi Mandapam. Maximum number of International tourists visit Marina Beach,

Shrines in Mylapore, Triplicane and Besant Nagar, Cholamandal Artist Village and Crocodile Park.

Valluvarkottam



Marina Beach



viii) Biodiversity

South of the city, along the East Coast Road, is the Madras Crocodile Bank Trust, which hosts several fresh-water and salt-water crocodiles, alligators, gharials, and also turtles and snakes. It is considered an important institute for herpetological research and performs services such as snake venom extraction for preparing antidotes.



Madras Crocodile Bank

A large number of cattle egrets, pond herons and other water birds can be seen in the rivers of Coovum and Adyar. In addition, Tamil Nadu Government classified the Adyar Estuary into a protected eco-system.

Marshy wetlands such as Pallikaranai also play host to a number of migratory birds during the monsoon and winter. It is one of the prioritized wetlands of Tamil Nadu. Unfortunately, this wetland is being degraded by pollution and garbage dumping and is converted into housing colonies, railway terminus etc. However, steps are being taken to restore this marshland. Over 300 species of birds have been recorded in the city and its neighborhood.

3.Impacts

i) Urbanization

Chennai is a 100% urbanised district. This has naturally led to an increase in congestion, overcrowding, steady growth of slums and squatter settlements and heavy strain on the infrastructure and services. Moreover, there is the migration from neighbouring and other districts in Tamil Nadu for employment opportunities. Increase in population put pressure on available land. Most of the slums in the city are of linear type located along waterfront

(i.e., Banks of the Adyar River, Buckingham Canal, Coovum River and Otteri Nullah) and along the roadside.



Kodungaiyur solid waste land fill

City's sewerage system consists of a network of gravity main, force mains and pumping stations serving the different parts of the city. The sewage collected from each area is pumped from one pumping station to another by relay and conveyed to Kasimedu north of the Harbour from where it is disposed into the sea. The present system covers 85% of the city's population.

Solid waste generation in the district is 2500 tonne / day of which nearly 84% of the waste is being collected and nearly 8400 workers are engaged in the existing solid waste collection system either directly or indirectly. Two land fill pits are present at Kodungaiyur and Perungudi. With regard to the composition of garbage in the city, it is seen that compostable matter constitutes only 16.4% of garbage while ash and fine earth account for nearly 20% of the weight.

ii) Industrial development

Chennai is one of the important industrial centres of Tamil Nadu. As a district, it ranks third in industrial development after Coimbatore and Salem district in Tamil Nadu.

The major industries in and around the Chennai district included

- Ashok Leyland Ltd.
- T.I. Cycles of India Ltd.
- Enfield India Ltd.
- Sundaram Fasteners Ltd.
- Parry Confectionery Ltd.
- Wheels India Ltd.
- India Cements Ltd.
- Automobile Products of India
- ACT India Ltd.
- Amrutanjan Ltd.

India Meters

- The K.C.P Ltd.
- Madras Refineries Ltd.
- Manali Petrochemical Ltd.
- Ponds India Ltd.
- Rane Brake Linings Ltd., etc.
- Madras Fertilizers Ltd.
- TVS – Lucas Ltd.

To check the air pollution, Tamil Nadu Pollution Control Board has identified 5 places in the district. (Anna Nagar, CLRI, Kilpauk, T.Nagar, Vallalar Nagar) to monitor the emission levels of vehicles. Moreover, TNPCB lays and modifies the effluent standards for the sewage effluents and for the emission of air pollutants into the atmosphere from industrial plants and automobiles. Though some of the industrial and urban areas are categorised as air pollution stressed, ambient air quality monitoring in residential, commercial and

industrial locations indicate that the concentration of ambient air pollutants are within permissible levels.

In terms of discharge of industrial effluents by the industries, Tamil Nadu Pollution Control Board has identified seven major industries in red category, which are listed below

- Simpson & Co.,
- Rane Madras Ltd.
- I.C.F. Shell division
- Apollo Cancer Hospital
- Addison & Co.
- Tractors and Farm Equipment Ltd.
- Southern Railway, Chennai Central

These industries are disposing 509.2 Kiloliters (kl) of sewage, 42.3 kl of trade effluent and 360 kl of wastewater in the city drains every day, and these are treated before disposal. Tree plantations also help in reducing the air pollution by the absorption of CO₂ gases for their metabolic activities.

iii) Thermal power generation

The Ennore Thermal power station and Basin Bridge Thermal power station are the two power plants located in and around Chennai City. The higher percentage of electricity consumption is registered in domestic sector i.e. 63%, as the district is predominantly a settlement area, and the commercial establishments consume 16%. The district is electrified 100%. Alternative energy sources such as solar, Bio-gas and windmills would augment supply and be environment-friendly in comparison to fossil fuel.

iv) Natural hazards

As a coastal city, Chennai district is susceptible to erosion particularly on the Northern side.

v) Natural disaster prone areas

Chennai is subjected to flooding during the Northeast monsoon. Catastrophic flooding occurred in 1976 and 1985 causing enormous damage to property, infrastructure and the economy. Relief and rehabilitation measures had to be taken up by the government agencies. Settlements on the banks of the waterways and in the flood plains are most vulnerable.

Chennai is a low-lying area and the land surface is almost flat. The damage was severe during 2004 Indian Ocean tsunami as it accounted for thousands of human lives and severe material damage. The even topography of the land throughout the district is prone to floods. It rises slightly as the distance from the sea-shore increases but the average elevation of the city is not more than 22' above mean sea-level, while most of the localities are just at sea-level and drainage in such areas remains a serious problem.

4. Government initiatives

i) Coastal protection initiatives

Kaatupallikuppam

This village is situated north of Ennore Port and south of Pulicat lake. During tsunami, water wall of height 3 m penetrated to about 300 m into the land. As the Ennore port breakwaters are intercepting the net northerly littoral drift, there is slight erosion at this village. This erosion may be magnified if not tackled. Hence, measures

like plantations and sand nourishment (dredged soil from Ennore port) is being carried out.

Ennore Creek

The river Kosasthalaiyar River discharges into the Bay of Bengal at Ennore. The Ennore port is located on the northern side of the river mouth.

Ennore to Royapuram

The stretch of about 15km from Ennore towards its south upto Royapuram comprises a number of fishing hamlets. Most of the beaches have been protected by a seawall and combination of seawall and groynes. Even though, the beach from Chinna Kuppam (about 3 km from South of Ennore creek mouth) to Ennore mouth has been protected by a seawall this stretch is liable to be eroded in future. Hence, this should be strengthened by a groynes field, by which additional beach width can be gained, thereby not only stabilizing the seawall but also to win additional beach..

Reach between the two groynes fields (Masthan Koil Kuppam to Popular Weigh Bridge)

A portion of this stretch of the coast has been proposed to be protected by two groynes fields in addition to a seawall, out of which one stretch with six groynes is completed and the second stretch is to be taken up by TNRDC. In between the two groynes fields, industries and fishing hamlets are located along this stretch.

Stretch between Savorit to Northern breakwater of fishing harbor

The existing seawall at this stretch is in a depleted condition. The stretch of the

coast from the North of Northern breakwater upto stretch II of the groyne field is to be constructed by Tamil Nadu Road Development Corporation.

Stretch between Chennai port to Foreshore estate

The Marina beach is World's second longest beach formed due to the interception of the long shore sediment transport by the Chennai harbours Southern breakwater. This has resulted in the sand bar formation at the mouth of rivers Cooum and Adyar. Both the rivers run within the city of Chennai.

ii) Awareness initiatives

NGOs are mainly dealing with environmental issues like Environmental impact studies, Environmental awareness, Environmental Education etc. Around 45 NGOs have been identified in the District. Various awareness creation activities have been conducted among the fisher folk on tsunami and CRZ issues.

5. Summary / Conclusion

- Chennai is situated in the North-Eastern end of Tamil Nadu on the coast of Bay of Bengal.
- The total area of the district is 178. 2 sq.km It is bounded by the Bay of Bengal in the east and on the remaining three sides by Kancheepuram and Thiruvallur districts.
- Chennai City is one of the oldest Cities of India with 5 taluks and 55 villages.

- Chennai has a tropical wet and dry climate. The city lies on the thermal equator and is also on the coast, which prevents extreme variation in seasonal temperature.
- The urban nature of district indicates that no activities are being carried out with respect to Agricultural and Horticulture.
- Chennai city today is devoid of any typical agriculture areas but can still be proud of some of the well maintained green belts.
- The indigenous trees found are *Azadirachta indica*, *Mangifera indica*, *Tamarindus indica*, *Albizia saman*, *Albizia lebbek*, *Ficus benghalensis*, *Cocos nucifera* and *Ficus religiosa*. Stretches of casuarina plantations are available on the sea-coast beyond the mouth of the Adyar in the South and Tondiarpet in the North.
- Chennai district is not endowed with many forest resources except the Guindy National Park with an area of 270.57 ha, which is under Reserve Forest category.
- Chennai is a 100% urbanised district. This has naturally led to an increase in congestion, overcrowding, steady growth of slums and squatter settlements and heavy strain on the infrastructure and services.
- No marked resources like corals, mangroves and seagrasses have been recorded in this district.