THIRUVARUR DISTRICT

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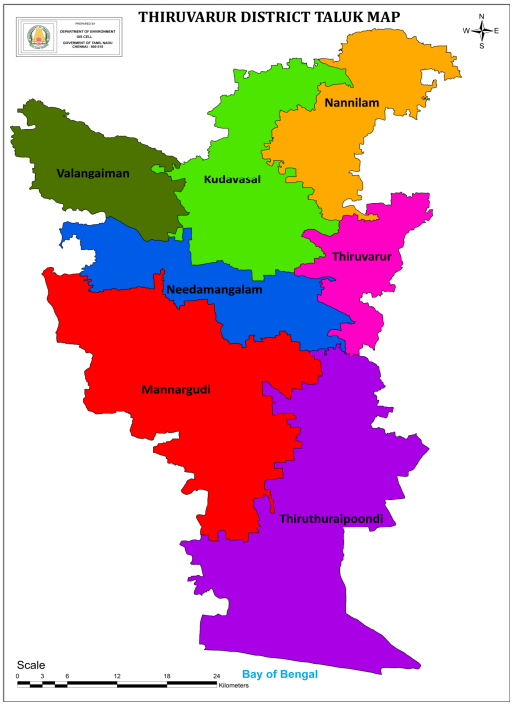
1. Introduction

i) Geographical location of the district

The district of Thiruvarur was carved out as a separate district by detaching Valangaiman Taluk from Thanjavur District and Thiruvarur, Nannilam, Kudavasal, Needamangalam, Mannargudi, Thirutturaippoondi Taluks from Nagappatinam District on 01.01.1997. It lies between 10°20‘ and 11 ° 07’ North latitude and 79 ° 15’ and 79 ° 45’ East longitude. The total area of the district is 2,377 sq.km

ii) Administrative profile

There are 2 revenue divisions, 7 taluks, 10 community development blocks, 3 municipalties, 7 town panchayats and 573 villages in Thiruvarur district.



iii) Meteorological information

The maximum temperature is about 35.19^{0}C and the minimum temperature is about 26.39^{0}C. Duststorms, whirl winds and dusty winds blow from various quarters towards the end of May. The Southwest winds that set in during April are strongest in June and continue till September. Northeast monsoon starts during the month of October and blow till January. Cyclonic storm with varying wind velocity affect once in 3 or 4 years during the month of November-December. Both these storms affect the plantation crop. During Southwest monsoon the air is calm and undisturbed. The Northeast monsoon which starts in October and ends in December contributes about 60% of the total annual rainfall. The Southwest monsoon rains from June to September and summer rains from March to May accounts equally for the rest of the annual rainfall.

Rainfall in mm

South West

Normal	301.8
Actual	532.5

North East

Minimum	665.4
Actual	1118.8

2. Resources availability

i) Land resources

Since the district is represented by Cauvery Deltaic Zone, sandy coastal alluvium is the predominant soil type in this district accounting for 56.78% and other types of soil cover 43.22% of the total area. About 3.49% of the land available for cultivation suffers from salinity/alkalinity and another 56.21% is prone to floods. About 7.09% of the land is water logged and marshy. As the district is irrigated to a larger extent by extensive canal system of the Cauvery basin, problems associated with floods and excess water seepage result in more areas getting affected by flooding or water logging. About 17.69% of the land is sandy, desert/coastal.

ii) Agriculture and horticulture

Thiruvarur lies in the Cauvery River basin and the main occupation of the inhabitants of the town and surrounding regions is agriculture. More than 70% of the workforce is involved in agriculture; 14% being cultivators and rest are agricultural labourers. Paddy is cultivated in three seasons namely Kuruvai (June – August) Samba (August – January) and Thaladi (January – March). Other cereal crops of the district are cumbu, ragi, maize, korra and varagu. The pulses grown in the district are red gram green gram and black gram. Other food crops are condiments and species, sugarcane, fruits and vegetables. Among non-food crops, cotton/fibre, edible oil crops (groundnut, gingelly and coconuts) non-edible oil crops (castor though in very small area) are the important ones. Cereals, pulses and oil seeds are the three important crops produced in the district. Fruits and vegetables are cultivated in the district with proper nurseries and vegetable farms.

Total cultivated area (ha)	265281	
Net area sown	152632	
Area sown more than once	112649	
Area and production of principal crops	**Area**	**Production (Tonnes)**
Rice	160	4,83,125
Pulses	94	25,310
Sugarcane (Gur)	0.94	1,71,958
Groundnut	1.90	6,832
Gingelly	0.36	367
Agricultural Land Holdings (2005-2006)		
Holdings	1,58,100	
Area	1,46,028	
Average size of holdings	0.924	
Important food crops	rice, green gram, black gram	
Important non food crops	cotton, groundnut, coconut, gingelly, palm, flowers, palm oil, oil seeds	

iii) Forest resources

The forests in the Thanjavur Forest Division which comprise Thiruvarur can be divided into three regions from the topography, and flora point of view. They are the alluvial regions or riverine land areas; The areas on the banks of rivers and canal in the form of narrow strips. Teak plantations mostly cover these areas and wherever the soil is unsuitable for *Camellia sinensis*, *Dalbergia sisso, Terminalia arjuna* and Eucalyptus have been planted.

The lateritic region: This region contains mostly throny scrub jungles, tropical thorn forests and tropical dry evergreen forests.

The coastal regions: This zone contains causurina plantations, mangrove scrub, mangrove forest and southern thorn scrub jungle. The entire stretch of coastal mangroves with lagoons and back waters lying along the coast fall in this category.

Forest area (ha)	
Reserved forest (ha)	9476.547
Reserved lands (ha)	11.055
Forest products	
Teak poles (Cum)	1229.916
Pulp wood (MT)	502.241
Mino forest products (MT)	1.957

i) Mineral resources

Thiruvarur has no major mineral resources. Sand is the only minor mineral available at river beds. It has got natural gas deposits. Two large scale power generation plants and few more natural gas units have already been started in the district.

v) Water resources

The river Cauvery and its tributaries are the main rivers of the district. The Cauvery is considered to be the best of the rivers that drain in Southern peninsula of India. It flows through Mysore, Dharmapuri, Salem, Erode, Tiruchirappalli and Thanjavur districts covering a distance of about 770 km draining an area of about 72,800 sq. km in all. Springing from a spot lying on Brahma giri mountain of western ghats at a height of 1,320 meter above sea level, it meanders its way across Karnataka and Tamil Vettar, Odambegiar, Kaduvaiyar, Pandavayar and Vellayar are the minor basins in Tiruvarur district. The main sources of irrigation in Tiruvarur district are canals, tanks and wells.

vi) Fisheries production

This district has a coast line of 47.2 km The district has good fishing potential in view of its rich coastal area. The coastal fish production is more than inland fish production and the production has increased steadily in the coastal area but it has fluctuations in the inland area.

No. of coastal blocks 1

No. of coastal centres 14

Marine fish production (tonne) 12,360

Inland fish production (tonne) 9,730

No. of fisherman engaged

(Marine/Inland) 5,750 / 7,042

vii) Heritage sites

Sri Thyagarajaswamy temple

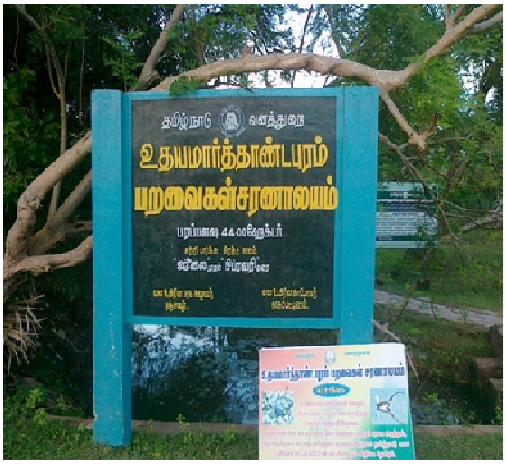
Sri Thyagarajaswamy temple at Tiruvarur dedicated to Lord Siva dates back to pre-historic days. It is the second biggest shrine. As Sri Sambandai and Appa have sung about the deity, this temple can be presumed to be in existence even in the 7th century AD. This is one of the 'Panch Boothe' (five elements) 'Sthalam' and is famous as the seat of the 'Prithvi' (earth) Lingam. The three giants of Carnatic music namely Sri Thyagaraja, Sri Syama Sastry and Sri Muthuswamy Deekshitar were all born at Tiruvarur. This is one of the well-known shrines of South India and covers an area of 30 acres.

Sri Thyagarajaswamy temple

The main structure consists of a pagoda; three prakaram, 1,008 stone pillars, four sanctum and six mandapas. Sri Thyagarajaswamy and his consort Sri Kammalambal, Sri Vanmiganathai with his consort, Nilothpalambal are the principal deities of the temple. The Moolavur, Sri Vamikanthan is a Swayambu Lingam. The Brahmothsavam in Panguni and the Adi Pooram are the two important festivals celebrated annually.

Tiruvarur is a place for the musical Trinity and most of the South Indian musicians are connected with it in one way or the other. The wooden car of Tiruvarur is the biggest of all the temple cars in the State. Historical importance of Tiruvarur lies in the legend of Manu Chola's just judgement of death of his only son, for killing a calf by driving his chariot over the calf.

Muthupet and Udayamarthandapuram are the other main tourist spots in Tiruvarur district. The special significance



Udayamarthandapuram Bird Sanctuary

is the lagoon and bird sanctuary. The two tourist spots are visited from August to March. Tourists from India and foreign countries have been steadily increasing. These two tourist spots are also included in the tourist circuits identified by the Tourism Department.

viii) Biodiversity

Muthupet mangrove forest is located at the Southern end of the Cauvery delta, covering an area of approximately 13,500 ha of which only 4% is occupied by well-grown mangroves. The rivers Paminiyar, Koraiyar, Kilaithankiyar, Marakkakoraiyar and other tributaries of the river Cauvery flow through Muthupet and adjacent villages. At the tail end, they form a lagoon before meeting the sea.

Muthupet mangrove forest

The Northern and Western borders of the lagoon are occupied by muddy silt ground which is devoid of mangroves. The mangroves beyond Muthupet lagoon are discontinuously found along the shore extending up to Point Calimere. Muthupet mangrove forest was under the control of Chatram Department from 1853 to 1912. The gazette of the presidency of Madras Gazette (1937) shows, that, half of the revenue from 1923 to 1936 obtained through selling of mangrove products was paid to the revenue department and the remaining half was spent to maintain the "Chatrams" (Charity homes). The government declared the Muthupet mangrove forest as revenue forest in February 1937 and accordingly the mangrove forest was handed over to the Forest Department of the Madras presidency.

The forest is maintained by the Tamil Nadu Forest Department. The mangrove forest is divided into the Palanjur, Thamarankottai, Maravakkadu, Vadakadu, Thuraikadu and Muthupet Reserve forests. Muthupet Reserve Forest covers the lagoon, river creeks and the mudflats. Muthupet lagoon (mullipallam) is a spectacular natural creation, which is 8 km from nearby Muthupet town and can be reached only by boat. The lagoon is shallow with an average depth of 1 m. The bottom of the lagoon is formed of silt clay substratum. The tidal fluctuations can be observed well with the exposure of oyster beds and roots during low tide.

The tidal fluctuations play a major role in dispersing mangrove seeds. Dense mangroves mostly cover the lagoon shore. The islets are found on western sides which are submerged during high tide. The salinity is the major environmental factor, controlling zonation of Muthupet mangrove forest. *Avicennia marina* conquers the forest which is found as a single dominant species.

The southern mudflat separates the lagoon from the adjacent sea that leaves a permanent mouth of lagoon with seasonally opened shallow waterways. The width of mudflat increase from lagoon mouth to the eastern direction. The mudflat looks like a desert in summer, but the presence of dead gastropods under the surface soil layer and the erosion of soil at the centre of mudflat reveal the submergence of mudflat during flood. There is a difference between the lagoon shore and seashore of the same mudflat, in the aspect of distance of mangroves from fluctuating water level.

The mangroves have grown close to water level in lagoon side but not in seashore. The reason may be the difference in the nature of fine silt clay deposition have carried by the rivers. In the degraded central part of the mudflat, the soft fine silt is found only around the salt marshes. The remaining barren ground is hard clay which may due to the erosion of surface silt by wind or floodwater.

The density of mangroves in eastern side of Muthupet lagoon is comparatively lower than other areas. Tamil Nadu Forest Department has excavated several canals across the mudflat. Each main canal, which enhances the water movement between sea and lagoon has several sub canals on either side with a substantial number of mangrove seedlings. The western side has a protruding land pocket formed as an islet-like structure. This part of the lagoon lies near Koraiyar river mouth with small mangrove patches.

3. Impacts

i) Urbanization

The estimated sewage generation is 81.04 lakh liters/day among municipalities and 31.40 lakh liters/day among town panchayats. The district does not have any treatment plant and hence there is no organised disposal of sewage. Nature of disposal and quantity through river water is 81.04 lakh litre/day in municipalities and 31.40 lakh litre/day in town panchayats. The solid waste generation is highest in Mannargudi among municipalities and in Muthupet among town panchayats. Overall the solid waste generated adds upto 31 tonnes with a collection efficiency of 72.51%. Compostable matter covers 75% of the total compositions which include rags, wood pieces etc.

ii) Industrial development

There are no major polluting industries in the district except the two Sugar industries. The district has been a flourishing centre of cottage industries. Mats made of korai, screw pine, palm and coconut leaves are much in demand. The mat weaving is spread over in a number of places, but the superior varieties of mats are made in Mudukkur. The district is also famous for safety matches. The district is equally well known for its pith articles consisting of beautiful models of Hindu idols, temples, mosques, flower garlands, bouquets, parrots etc. Pith is grown on the beds of tanks in Mannargudi. Tiruvarur is known for the manufacture of musical instruments of Jack wood like the Veena, Tambura, Violin, Mridangam and Kanjara.

As per the ambient air quality status, the average industrial SPM, SO, NOX and CO values recorded near an industrial unit are found to be well within the limits in the district. Major air pollution sources in the district are located in two villages, Vadapathimangalam (Tiruvarur taluk) and Keeranur (Nannilam taluk). The industries of the district are found to be have the emission rates under the set standards.

iii) Natural hazards

The shoreline is undergoing severe erosion. If this rate of erosion continues, mangroves will soon be exposed directly to the sea, where the wave action is high. This may result in the uprooting of trees that are exposed to high wave energy. Regeneration will be adversely affected as the waves wash away the seeds. In Muthupet, the tidal water flow into the mangrove wetland becomes less, leading to increased salinity of the stagnant water due to evaporation.

iv) Natural disaster

Cyclonic storm havoc occur normally once in 3 or 4 years and heavy downpour during Northeast monsoon leads to flooding of the district and damages to field crops and wealth of soil. It has been ascertained from the available information that all the taluks were affected by flood during the year 1991-92 and affected by cyclone during the year 1993-94. Coastal region is prone to tsunami.

1. Government initiatives

i) Initiatives to improve fisher folk livelihood

The following inland Fishermen Co-Operative Societies are functioning at Tiruvarur district.

List of inland Fishermen Co-operative Society with number of members

1. Tiruvarur inland Fishermen Co-operative Society 3496
2. Kudavasal inland Fishermen Co-operative Society 302
3. Thiruthuraipoondi inland Fishermen Co-operative Society 812
4. Mannargudi inland Fishermen Co-operative Society 503
5. Needamangalam inland Fishermen Co-operative Society 270
6. Valangaiman inland Fishermen Co-operative Society 1064
7. Nannilam inland Fishermen Co-operative Society 592

1. Welfare scheme implemented through Fishermen Co-operative Societies

Fishing Rights have been given to Fishermen Co-operative Society members after obtaining orders from the District Collector for every year. Getting insurance claim when Fishermen Co-Operative Society members meet with accidents or happen to die (or) become handicap Rs.1 lakh for the family of the deceased and Rs.50,000/-for the handicapped member is given.

2. Thanjavur District Fish Farmers Development Agency (FFDA)

The Thanjavur District Fish Farmers Development Agency is one of the oldest FFDAs established in 1977 covering Thanjavur, Tiruvarur and Nagapattinam districts working along with the office of the Assistant Director of Fisheries (inland fisheries) Tiruvarur. There are more than 1000 registered fish farmers as members of this agency. The Thanjavur district Collector is the Chairman of the agency and the Assistant Director of fisheries the Chief Executive Officer. The agency is registering the fish farmers as its members. Ministry of Agriculture, Government of India fixed the norms to release subsidy for the development of fresh water aquaculture through Fish Farmers Development Agency for construction of new ponds. The unit cost is Rs.3.00 lakh / ha and subsidy is 20% of the unit cost @ Rs.60,000/- ha for all farmers except SC, STS for whom it is Rs.75,000/- ha (25%). The assistance under FFDA is given only once to a beneficiary to a component. The beneficiary can avail subsidy for a maximum of 5 ha on seniority basis.

3. Fishermen Welfare Board

In Tami Nadu the male (or) female person aged from 18 to 65 years and engaged in fishing activities and allied can become the member in fishermen welfare board. This scheme started functioning from 2007 onwards. Relief amount of Rs.1 lakh and cremation amount of Rs.12,500/- will be given for accident death of members family and Rs.10,000/- will be given to natural death fisherman family. Besides, assistance for education and marriage are also given to the children of the members.

4. ATMA

Under Agriculture Technology Management Agency (ATMA) Scheme Rs.4,000/- is alloted for Demonstration to the fish farmers by way of supplying fish seeds and fish feeds. Group Discussion with farmers to clarify doubts on improvement of the yield in fish culture for which a sum of Rs.500/- has been allotted for one group discussion.

5. Farm School

One Farm School has been started at Thirumakkottai which demonstrates the methods of fish culture from preparation of ponds to harvest.

ii) Coastal protection initiatives

Muthupet mangroves act as a bio shield in this district. Thiruvarur district is expected to have future storm surges up to around 5.6 and 6.9 m, It is assumed that the coastal zone up to 10 m is at risk in these districts. Various projects are in operation to protect the coast.

iii) Awareness initiatives

Various awareness creation activities have been made among the fisher folk on tsunami and CRZ issues by different Government and Non Government organizations. Attempts have been made to develop bioshields, rebuild livelihoods, and reclaim soil in the tsunami affected agricultural fields in Thiruvarur district.

iv) Biodiversity

Mangrove restoration has been done by M.S. Swaminathan Research Foundation after the tsunami. MSSRF started a project during 1993 in Muthupet mangrove wetlands to identify causes of degradation of Muthupet mangrove wetlands and to develop and demonstrate techniques to restore the degraded areas.

5. Summary / Conclusion

- The district of Thiruvarur was carved from Thanjavur district and Nagapattinam districts on 01.01.1997.
- The total area of the district is 2377 sq.km

- There are 2 revenue divisions, 7 taluks, 10 community development blocks, 3 municipalties, 7 town panchayats and 573 villages in Thiruvarur district.

- The river Cauvery and its tributaries are the main rivers of the district.

- Thiruvarur lies in the Cauvery River basin and the main occupation of the inhabitants of the town and surrounding regions is agriculture.

- Since the district is situated in by Cauvery Deltaic Zone, sandy coastal alluvium is the predominant soil type in this district accounting for 56.78% and other types of soil cover 43.22% of the total area.

  Paddy is cultivated during three seasons and other cereal crops of the district are cumbu, ragi, maize, korra and varagu.

- Total forest area includes 9,476.547 ha of Reserved Forest and 11.055 ha of Reserved lands.

- Thiruvarur has no major mineral resources. Sand is the only minor mineral available in the river beds. It has got natural gas deposits.

- This district has a coast line of 47.2 km and has good fishing potential in view of its rich coastal area.

- There are no major polluting industries in the district except sugar plants.

- Muthupet mangroves forest is an important marine ecosystem which acts as a bio shield in this district.

- Mangrove restoration has been done by M.S. Swaminathan Research foundation after the tsunami.