CHAPTER-II

STUDY AREA AND ITS IMPORTANCE

2.0 INTRODUCTION

Ramanathapuram district is one of the important districts of the State because of famous pilgrimage centre and the Government of India has identified the district as one of the most backward and, drought prone area of peninsular India. The district is situated in the Southeast portion of the state and has a lengthier coast line amongst the districts of the State (261 km). Coral limestone, Shell limestone, Gypsum, Ilemenite and Garnet sands are some of the economic point of view in this district. Apart from this, fishing and salt pan development are observed along the coast. Ramanathapuram District is facing manifold problems of rapid urbanisation due to industrial development especially along the coastal area.

2.1 LOCATION OF THE STUDY AREA

Ramanathapuram district is located in the southeastern coastal part of Tamil Nadu. It lies in between latitude 9°5' and 9°56' longitude 78°25' and 79°26' (Fig.2.1). It covers an area of about 4207.38 sq.km. It has got 6 taluks and 11 blocks for the entire district. Ramanathapuram district receives scanty Rainfall which averages 889 mm annually. The economy of the district is predominately dependent on agriculture and fishing. The sea coast which is nearly one fourth of the total length of coastal line (261 km) of the State also plays an important part in the economic development.
LOCATION OF THE STUDY AREA
RAMANATHAPURAM DISTRICT
TAMIL NADU STATE  SOUTH INDIA

FIG. 2.1
In addition to this the District contributes to marine fish production of about one fourth of the state. It has the unique advantage of year round fishing in Palk Bay area from April to October and in Gulf of Mannar from May to November. There is also a salt pan industry and the coastal area of Ramanathapuram attracts tourists as it is free from pollution, active aquatic environment and beaches. It had been proposed by the State Government to develop a marine park with water sports for the attraction of tourists for improving the economic status of the district.

2.2 PHYSIOGRAPHY

Ramanathapuram district is characterized by four distinct units. They are (i) The western and north western parts of the district coinciding with crystalline (Archaean rock) (ii) The middle portion of the western area, forming the flat upland with elevation ranging from 9.30 m to 20m. (iii) the vast black soil plains of Paramakudi, Mudukulathur, Ramanathapuram and Thiruvadanai taluks (iv) Chettinad plain consisting of Red soil being drained by Virsuli river and Pambar while Manimuthar river in parts of Thiruvadanai taluk In the sandy coastal area of Mudukulathur, Ramanathapuram, where the coast is fringed by sand dunes with swamps at their back. The general relief view of the study area is given in Fig.(2.2). The coast line in the study area is generally found to be trending towards south, taking an eastward trend near Devipattinam in a curve, enclaving Palk strait. The coastline in this area is more often sandy and occasionally rocky. Prominent beach rocks along with cliff coasts have been
observed in the neighbourhood of Mandapam. In the southern part of the study area, there is a beach rock found in the eastern tip of the Mandapam coast. The coastal plain here contains various coastal morpho units like spit, beach ridges, swales, sand complexes, mudflats and back waters. The coast line encircles the Rameswaram island and proceeds in West-South westerly direction towards Tuticorin. Major part of the coastal belt is covered by plain topography. The parts of Mudukulathur taluk and 75% of Ramnathapuram taluk have undulating topography.

2.3 DRAINAGE

The Drainage system consists of Vaigai, Gundar, Kortaliar, Virusuliar and its tributaries. The general trend of the rivers is from Northwest to Southeast (Fig.2.3). Vaigai is the biggest river of the study area it originates in the eastern slope of the western ghats at an altitude of 1500 m above means sea level. The valley adjoining Vairavanar valley received the waters of Periyar lake through the foreshore tunnel. Stream networks of Palar and Kortaliar mingle with Vaigai in that stretch. The river flows through dense forests and jungles for about 64 kms. Just at the point of entering the plains, Suruliar river joins. After a short distance, Theniar confluences with Vaigai. Vaigai enters the Ramnathapuram district near Paramakudi and flows in the southwest direction and debouches part of the water into the Ramnathapuram tank. Then the river takes its course parallel to the coast for a considerable distance and turns back before empties the water into Palk Bay.
Gundar river is formed by merging of several streams rising in the eastern slopes of Varaganad and Andipatty ranges above Uttappanayakkanur and Watrap. The confluenced streams flow southeast almost parallel to Vaigai. It enters the plains at Vaiyampatty in the Aruppukottai taluk and it takes a turn of easterly direction for about 3 km and turns towards south for 8 km. It passes through Thoopoor when it gets the addition of Sheverkottai stream flowing from the mountains of Tirunelveli district. Because of that, it gets strengthened and flows easterly between Tiruchuli and Palimadam washing the western wall of ruined fort of Ilupur. The Gundar river channel is generally controlled by well developed Northwest - Southeast fractures. It passes through mainly Thirumangalam and Mudukulathur taluks of Ramnathapuram district. From Ilupur it runs eastwardly and then turns south to Kamudhi. Then it continues to flow with the excess of water and finally reaches the Gulf of Mannar near Makkaiyur, the total length is nearly 150 km. The river is generally narrow in nature, widening at the points of joining with tributaries and its mouth is wide and shallow. It is the main water supplier for about 65 tanks in Mudukulathur taluk.

Verusuli river is an empirical stream. It is narrow in nature. It originates in the highlands near Piramalai. After the fusing of one or three minor streams, it flows Northeast towards Devakottai. It again branches into two small streams, the northern branch run easterly for about 5 km and then separates into 2 streams taking on southeast course of about 16 km and mingles with Pamban below Adavathoor, while the south branch maintains southeasterly course at a stretch for about 27 kms. It feeds several tanks along its course and finally
debouches the water into the sea. Kottakariyur river is a small stream, formed by the confluence of two rivulets, it is not confluencing with sea. In the midway of its voyage it discharges the entire water into Rajasingamangalam tank. Eventhough, the district experiences and many small rivers and tributaries, all of them are of highly seasonal and the flow in the rivers are hardly few days in a calendar year.

2.4 CLIMATE

The prevalence of tropical climate is characteristic of this region. The district is generally very dry. The coastal belt is influenced by cool sea breeze. April to June are the hottest months with temperature shooting upto 41°C with high humidity. The average temperature varies from 25.9°C to 30.6°C and the average humidity is 79%. Winter season is from December to January is not at all felt because of its geographical location. The higher temperature is recorded in April and the lowest during October-November.

2.5 RAINFALL

Ramnathapuram is one of the drought prone district of Tamil Nadu. Rainfall is erratic even in the monsoon season. The Southwest monsoon, starting from July persists till September, October and November, constitute the period of retreating monsoon. The period from December to February is the Northeast monsoon. The district is not experiencing bountiful rainfall. The average rainfall in the district is 888.63 mm (Table 2.1). The period from October to December is the main rainy season in the district. About 54% of the rainfall occurs in
the summer with thunder storms in such a way to relieve the oppressive heat. In the Southwest monsoon season, which brings heavy rains in other parts of India, offers very low rainfall in this district. Many times, it completely fails. The Paramakudi area is often receives the lowest rainfall (Fig.2.4).

Depressions and cyclonic storms originating in southern Bay of Bengal in the Southwest monsoon season and the first half of the Northeast monsoon, lay generally centered around this district and cross the coast, after bringing a havoc to properties and agricultural crops.

2.6 SOIL

Various types of soils are found to have distributed all over the district. Taxonomically coastal soils can be classified into seven sub groups as (1) Typic ustipsamments (2) Aquic udorthents (3) typic ustropepts (4) Vertic ustropepts (5) Calcia ustropepts (6) Vertic haplustalls and (7) entic chromusterts. These soils are commonly denoted as black, red, ferrugenous and arenaceous soil. Black soils are distributed in parts of Ramnathapuram, Paramakudi and Kamudi taluks with an average thickness of about 3 meters. The black soil is pasty in nature, highly porous and expands when it is wet. It is fertile and provides the base for large variety of crops. Especially in the Ramnathapuram areas, black soil contains nodules and concretions of
### TABLE-2.1 : AVERAGE MONTHLY AND ANNUAL RAINFALL
IN mm - RAMANATHAPURAM DISTRICT

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<th>MAR</th>
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<th>MAY</th>
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FIG. 2.4: MONTHLY AVERAGE RAINFALL

Tiruvadurai

Paramakudi

Ramanathapuram

Pamban

Rainfall (cm)

Rainfall (cm)

Rainfall (cm)

Rainfall (cm)

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Months

Months

Months

Months
FIG. 24: MONTHLY AVERAGE RAINFALL

Mudakkavarur

Mandapam

Morejulam

Karnithi
Kankar, red ferruginous soils are confined to few pockets around the villages of Paramakudi and Abiramam. This type is not suitable for cultivation.

Sandy alluvial soils are common in the river banks and streams courses. They have high feasibility except in saline areas. The coastal sandy soils are suitable for coconut farms and palm groves. In the district 4432.4 acres are under saline soils. Saline soils have a Electrical Conductivity (EC) of more than 2 mhos/cm². The alkaline soils are having pH value to the tune of more than 8.5 while Electrical Conductivity is below 1 mhos/cm². The alkaline soils of this area have more calcium than sodium. This enables the easy reclamation of areas under saline soils for cultivation.

2.7 VEGETATION

The total area under forests accounts 8% of the district and non agricultural land accounts 2% of the total area of district. The natural vegetation covers acts as barrier in presenting the infiltration of drifting sands in human settlements. Carnatic umbrella thorn forest is seen extensively all over the Ramnathapuram coast. Other natural vegetations are Karuvelam (Acadia SP), Illandai (Zizypus jujuba), Neem (Azadirachata Indica), Tamarind (Tamarindus Indica), Kodukapuli (Pithocolobicm Dulce), and herbs and shrubs like Avarai(Cassia Auriculata), Erruku (Calotropis Gigantia), Hariyali (Cynodon dactylon), Agave (Agave americana), Idai (Acaia planiforms), with its umbrella shaped crown forms 90% of the crop, dotted with Palmyra trees. In moisture rich coastal areas Acaca gives way to phönix species. To
prevent sea water erosion and the menace of drifting sands, carried by winds, the coastal areas are strengthened by planting casurina trees, as a part of afforestation programme.

2.8 AGRICULTURE

Dryland agriculture is practised in view of active water scarcity. 75% of the area comes under this category. Remaining 25% of the area includes fallow lands and cultivable waste lands. Chillies, millet, cotton are cultivated in Northeast monsoon, Palmyra and coconut trees occupy 20% and 10% of the total area. In this district, the value of output of crops is lower than other districts average output. Pulses are also one of the various food crops of the district.

2.9 COMMUNICATION

The district is well connected by Road and Rail with other parts of the state. NH7, terminating at Rameswaram, passes through the heart of the district. A state highway linking Rameswaram with Kanyakumari, the southern most tip of India, is criss crossing the district. The district is served by metre gauge section, to travel to the northern part of the state.
2.10 ECONOMICALY IMPORTANT MINERALS

Gypsum

Gypsum occurs in the form of Nodule in Kokkadi and Avastendai areas in Mudukulathur taluk, having a reserve of 30,480 tonnes. Crystals of Gypsum are widely reported to occur in Kilakarai, in the beds of ChinnAllem, PeriyAllem tanks of Valinokkam.

Illumenite and garnet sands

Small patches of illumenite and garnet are segregated along the coast of Valinokkam, Killakarai and north of Pamban.

Ramanathapuram district is generally a very dry and one among the drought prone districts. Dry land agriculture is practised in view of water scarcity. 75% of the area comes under this category. The available water is also inadequate. So the present study is focussed on the groundwater conditions with special reference to geology, geomorphology, which have a bearing over it.