CHAPTER 4

STUDY AREA

Nagapattinam, Nagore, Vellankanni taluks which are situated in the Nagapattinam district of Tamil Nadu have been selected as the study area to identify the impact of aquaculture on environment. Fishing is an important coastal activity in these areas. Nagapattinam has an ONGC offshore platform for oil exploration. This district comes under Vennar Division and the channels, Viz. Vettar, Velliyar and Kaduvaiyar supply water for the purpose of irrigation. There are no major industrial activities in these areas.

The coastal marine landform comprises of sand dunes, sandy plains, flat lands, salt pans and swamps. The entire coastal region, owing to the influence of sea, is saline. The soils of coastal regions are affected by salinity, either on the surface or in the subsurface or both (Soil Survey and land use Organisation 1967). The magnitude and degree of soil salinity of this coastal region vary. In these areas, mostly, traditional agriculture is practised with the help of filter points, canal water and rain water. Paddy is cultivated during rainy seasons. In saline areas, groundnut, tobacco, jasmine etc., are cultivated (Soil Survey and land use Organization, 1998).

The coastal region of Nagapattinam district covers an area of 22,875 ha (District Committee report 1984) and the coastal line runs through the taluks of Sirkazhi, Tarangambadi, Nanilam, Thiruhuraipundi, Nagore Vellankanni and
Vedaranyam. Generally, the width of the coastal line in these districts extend from 5 to 15 km from the sea.

4.1 LOCATION

Nagapattinam, Nagore and Velankanni areas lie between North latitude 11°00' to 10°30' and east longitude 79°45' to 80°00'.

4.2 CLIMATE

The climate in these areas is semi and tropical type with limited rainfall. The hottest period of the year is from April to September and the moderately cold winter from October to March. The mean annual atmospheric temperature is 28°C. The average maximum temperature of this area is 36°C (May) and the minimum is 29°C (Jan) (Soil Survey and Land use Organisation 1998).

4.3 PHYSIOGRAPHY AND DRAINAGE

Topography is generally flat and tends to slope gently towards the sea at roughly one foot/mile. In the coastal region, the elevation of land is 2 to 3 feet above M.S.L. Drainage is a problem in these 3 taluks (Nagai, Nagore, Vellakanni). In addition to this, water is let into the field for irrigation from the rivers and channels. This tract receives heavy downpour during the north-east monsoon (October to December) as a result, low lying areas get flooded and it takes several days for the water to drain. The ground water rises during this period and this leads to the development of alkalinity in some parts.
4.4 GEOLOGY

Geological survey has revealed the presence of fairly thick sequence of territorial and olden rocks in the Cauvery basin. On the surface, exposures of Mesozoic and continental Neogene sediments are observed. The soil survey of Nagapattinam report (1967) reveals the soil particular formations with depth as follows, deep reddish gray sandy soil, 0-14 m; dark reddish gray clay intermittent with fine clay, 15-25 meters; alluvial clay, gray and brownish earth gritty with ignotic fragments, 25 to 70 meters; colorless coarse to find grained, sub angular to sub rounded with lateritic pieces towards bottom. The geological formation of the Nagapattinam area is made up of completely alluvial soil deposit both of riverine and marine origin (Soil survey and Land use organization 1967). The total geographical area covered is 29,763 ha. Out of this, 214 ha. area is under uncultivable wasteland, 9,349 ha. of land is put to non-agriculture area and 4,626 ha land is under current fallow lands in Nagapattinam district (by Soil Survey and Land use Organization 1998).

4.5 IRRIGATION

Irrigation is mainly through a net work of canals from the Cauvery. In addition, some of the jungle rivers, tanks and wells of different kinds provide irrigation source.

4.6 INDUSTRIES

This district is not industrially developed, however, some small scale units are there and are maintained by panchayat and state government. There is
a steel rolling mill and a modern rice mill. There are small units like carpentry unit at Sikkil maintained by Nagapattinak panchayat.

4.7 WATER

The quality of ground water in the entire coastal area is saline. Soil Survey and Land use Organization (1967) revealed that the water table occurs at 8' to 30' inland and 5' to 10' in the coastal region. The water in the Cauvery and its tributaries and in main canals is of good quality. But the water at tail ends becomes charged with some amounts of carbonate due to tidal waves. Soil Survey and Land use Organization (1984) has examined the water from the bore hole aquifers in the depth range of 3 - 2494 m and revealed that the quality of medium and deep aquifers is moderate to poor. Paddy is the main crop cultivated by using river water. This district being at the tail end of the irrigation channels and because of the late arrival of water, the double croplands are slowly being converted into single crop wetlands. According to CMFRI - report (1995), all the shrimp farms are located in the marine deposits, where the ground water is already brackish. Hence, the possibility of polluting the ground water (which is already brackish) by the aquaculture is minimum.

4.8 SOIL

75% of the coastal areas in this district are saline in nature (CMFRI 1995) and Soil Survey and Land use Organization 1967 & 1984). The cause of salinity of soil is due to a combination of factors, which are geological, climatic, hydrological, monsoonnic etc. In 1984, the Tamil Nadu Government has recommended shrimp farming as a potential venture for improving the socio-economic condition of Nagapattinam district.
The type of soil series consists of very dark, grey brown to dark grey, brown, non-calcareous, neutral to saline, fine textured, occurring near to coastal line. Sand pockets are predominant in intermittent lagoons. They are moderate to poorly drain with low permeability. For better understanding of the nature of soil and water prior to the commencement of shrimp farming activity, the soil maps of 1967 and 1984 land use maps prepared by Government of Tamil Nadu, Thanjavur were referred and the Soil Atlas for Nagapattinum district prepared by Soil Survey and Landuse Organization (1988) (Coimbatore) was also referred. According to the report of 1967 itself by Soil Survey and Landuse Organisation in 1984 also reported that the coastal area was affected by surface and subsurface salinity and alkalinity. A report on coastal soils by Natarjan (1991) also revealed that out of the total geographical area of 9,41,786 ha. in this district, the coastal area consists of 1,84,351,06 ha. Of this 1,41,559 ha. were found to have problematic soil. According to CMFRI (1995) report, prawn farming has paved the way for utilization of the barren, uncultivated lands. Further, the land which was under cultivation about 20 years back has now become uncultivated / uncultivable with the prospect of maximum of one crop per year due to inadequate and untimely water supply as this area comes under tail end of Cauvery irrigation system. Hence, farmers were frantically looking for alternate livelihood for the last few years. The areas under prawn farming in these three taluks are about 2,000 ha, which is less than 2% of total geographical area (source: Assistant director of statistics Nagapattinam district).