

Topography of Nanthikadal and Nayaru Lagoons

By

W. K. T. PERERA* & K. SACHITHANANTHAN*

Introduction

THIS paper presents results of the preliminary survey of the topography of the two lagoons Nanthikadal and Nayaru (fig. 1) in the North-East Coast of Sri Lanka. Knowledge of the topography of these two lagoons was found to be necessary (1) in the efficient management of the exploitation of the prawn resources in the lagoons, (2) in maintainance and regulation of the tidal flow in and out of the lagoons, and (3) in the enforcement of the fisheries regulations pertaining to these lagoons.

Nanthikadal

Nanthikadal is a lagoon situated near the town-ship of Mullativu. It is connected to the sea through a narrow strip of water called Vettuvaikal. Nanthikadal is also connected by a canal to another lagoon called Mathalan situated north of Mullativu. The riverlets Per Aru and Kodalikkallu Aru empty their fresh water into this lagoon during the rainy months of October to December.

The total surface area of Nanthikadal and Vettuvaikal is 60.45 Sq. Km. (23.24 Sq. Miles). When the lagoon retains its peak water content during the rainy months October to December. When the water level in the lagoon is high it leads to the natural removal of the sand bar formed at the region connecting Vettuvaikal to the open sea. The sand bar begins to form after the rainy season and the connection of the lagoon to the open sea is broken. The sand bar fails to open during the years of drought, when monsoon rains fail as it happened during 1974, 1975, and 1976. The improvement to the Muthaiyankaddu and other irrigation tanks, has resulted in much of the water that would have normally drained into the lagoon being retained in these reservoirs. During April to July of 1974, 1975, and 1976, the lagoon became devoid of water and bottom was exposed. However, deeper areas of Vettuvaikal retains water throughout the year. Nanthikadal has an even bottom, and the gradient from the shore to the deepest area is gentle. This evenness continues into the Vettuvaikal till it reaches the causeway. From the causeway it gradually deepens towards the sand bar. The greatest recorded depth of Nanthikadal is 1.6 m (5.3 ft.) below mean sea level located more than a mile away from the nearest shore (Fig. 2). The greatest recorded depth for Vettuvaikal is 4.5 m (15 ft.) below mean sea level near the sand bar at the exit to the sea. (Fig. 3). The bottom has a layer of soft black mud, much similar to the mud found in the deep channels of the Jaffna Lagoon (Sachithanathan and Perera 1970). This soft black mud layer is occasionally covered by a thin layer of soft brown coloured mud. The Northern, Western and Southern parts of Nanthikadal bottom has patches of sedentary vegetation, comprising of weeds belonging to the species *Najas Sp*; *Rupia sp.* and *Chara Sp.*, The bottom of Vettuvaikal is free from any type of vegetation. The Causeway running across Vettuvaikal has adequate openings for effective mixing of water between the two sections of Vettuvaikal, whenever the water level is higher than 0.6 m (2 ft.) below mean sea level. (fig. 4)

Nanthikadal supports an active prawn fishery and contributes greatly to the total prawn landings of Sri Lanka. The species of prawns that has been recorded are *Penaeus indicus*, *Penaeus monodon*, *Metapenaeus ensis*.

* Fisheries Research Station, P. O. Box 531, Colombo 3.

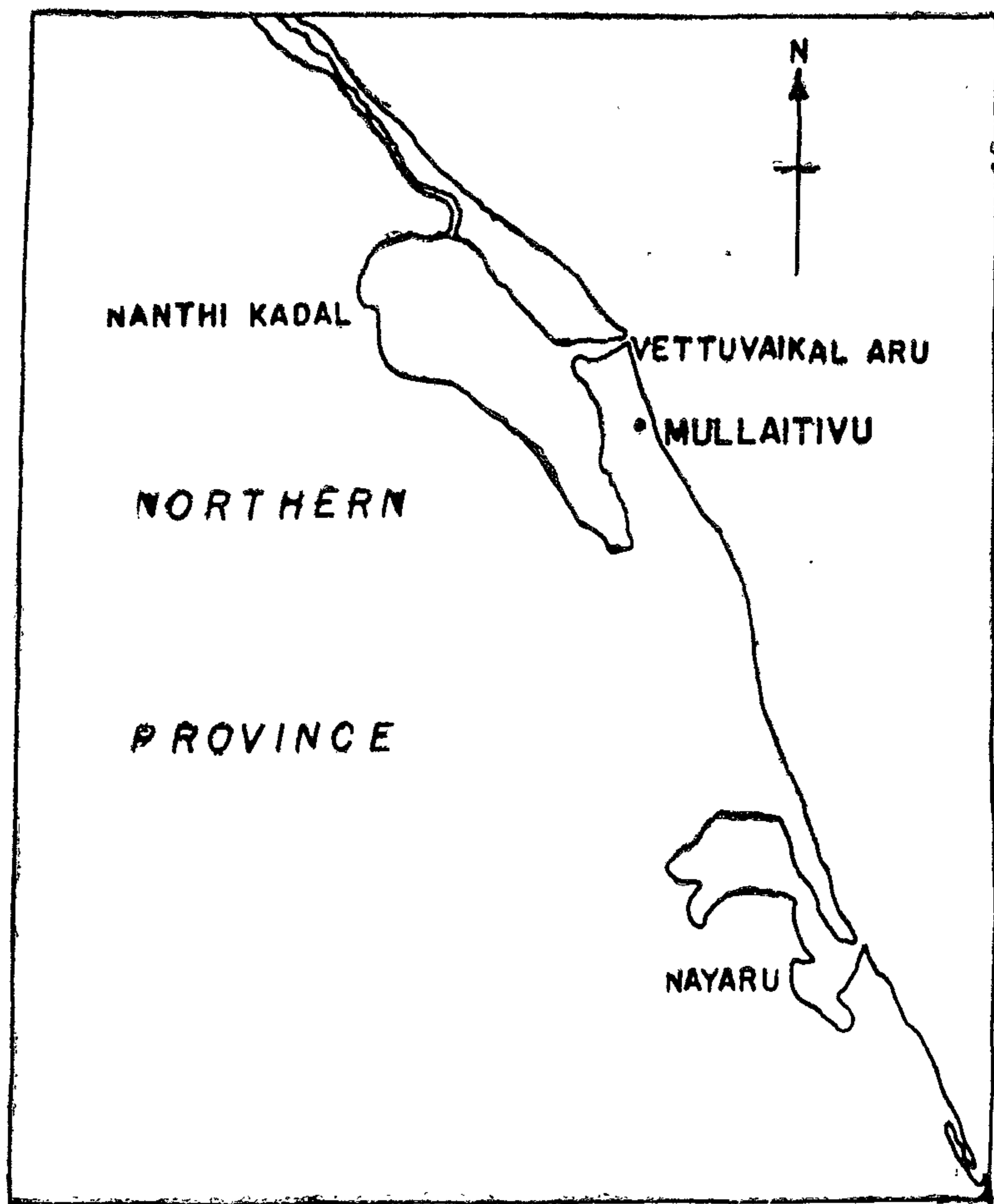


Fig. 1.—Location of Nanthi Kadal and Nayar Lagoon.

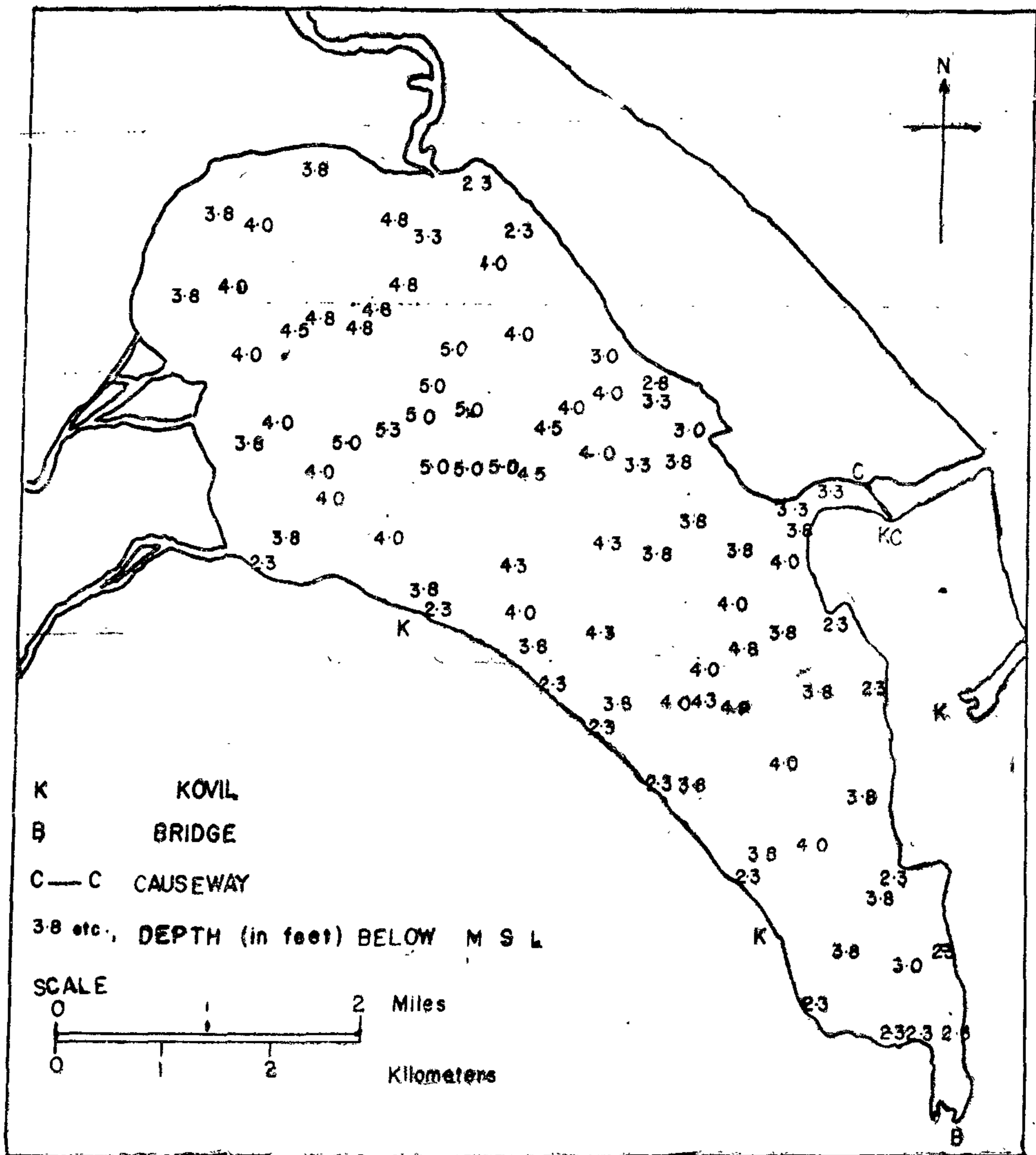


Fig. 2.—Nanthi Kadal Lagoon—Topography.

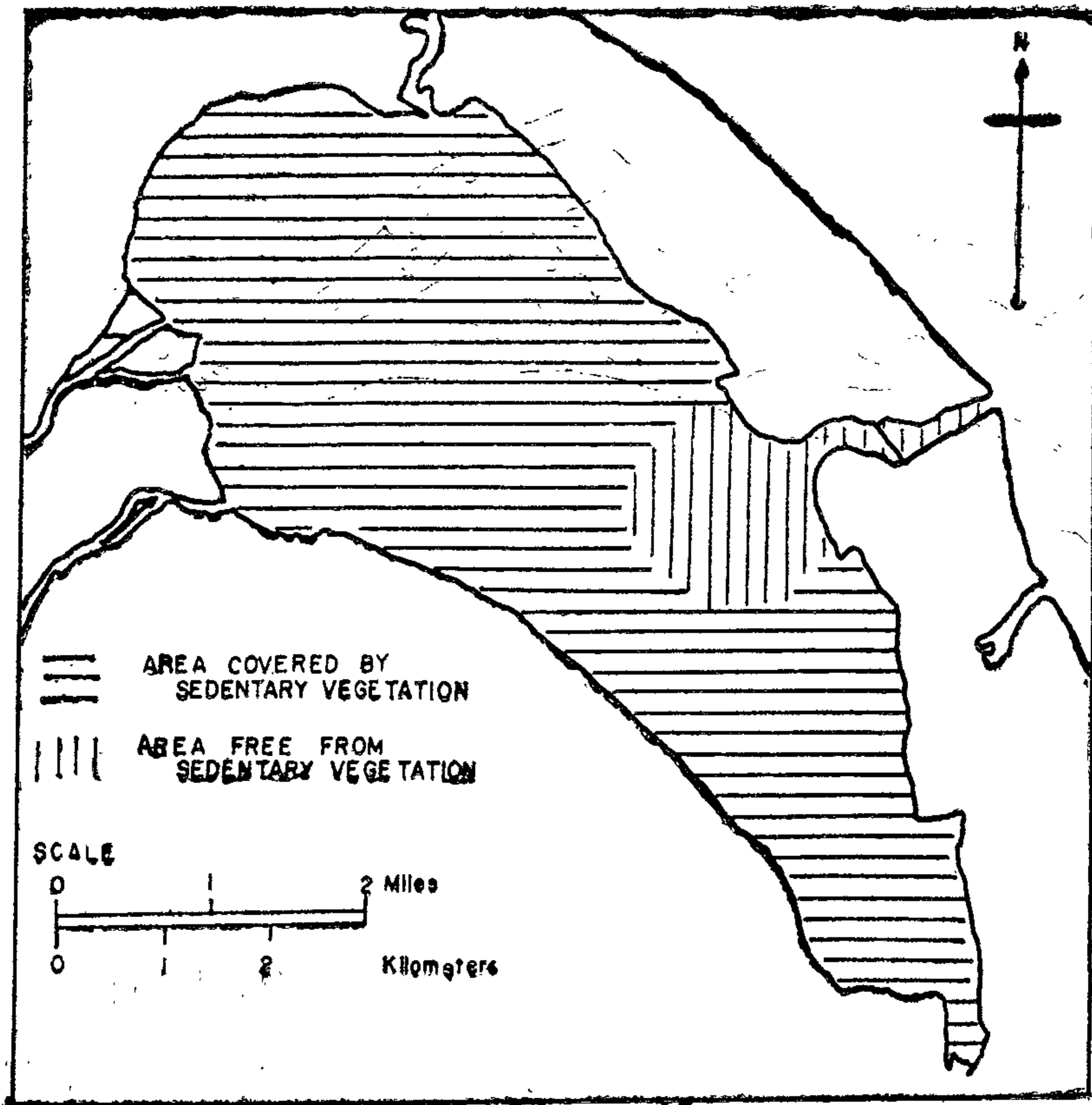


Fig. 4.—Sedentary Vegetation in Nanthi Kadal and Vettuvaikal.

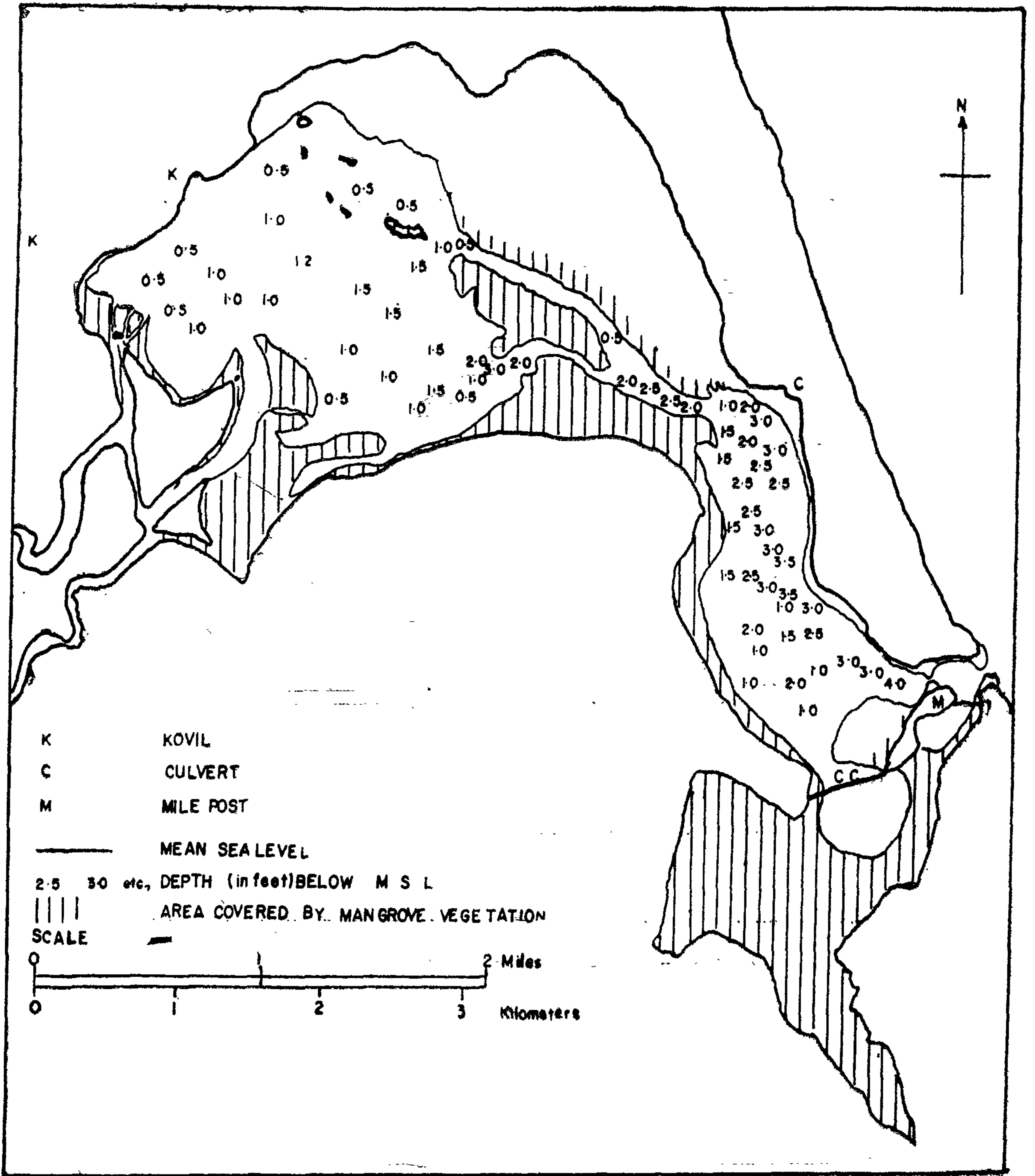


Fig. 5.—Nayaru Lagoon--Topography and Mangrove vegetation.

Nayaru

Nayaru lagoon is situated about ten miles south of the township of Mullaitivu. It is connected to the sea through a short narrow canal. The rivers Nayaru and Paladi Aru drain all their water into the lagoon during the rainy months of October to December.

Total surface area of Nayaru lagoon is 6.3 sq. km. (2.4 sq. miles) when the lagoon has a maximum supply of water. Peak water content is achieved during the rainy months resulting in the removal of the sand bar formed at the lagoon-sea connection point. The opening to the sea generally closes after the rainy season. Sand bar fails to open during the years of drought when the usual monsoon rains fail, as it happened during 1974, 1975 and 1976. However, the deeper areas of the lagoon retains water throughout the year.

Nayaru lagoon has an even and gentle sloping of the bottom. In the central part of the lagoon, the course of a channel could be traced close to the eastern shore, but this is being clogged by the silt brought down from the northern part and faces the danger of being covered by mangrove vegetation (Fig. 5). The area of the lagoon higher than the mean sea level is covered by mangrove vegetation (mainly by *Ceriops* sp.). Maximum recorded depth of the lagoon is 1.2 m(4 ft.) below mean sea level. Bottom has a layer of black mud similar to that of Nanthikadal.

Discussion

Construction of irrigation water reservoirs and the intervention of drought periods have resulted in inadequate drainage of fresh water into the two lagoons. So the sand bar at the point of connection in of the lagoon and the sea remained unbreached during the rainy season (October–December). This has interfered with the breeding cycle of certain species of Prawns which on maturity migrate to sea to breed and return to lagoon as juveniles.

The connection between the sea and the lagoon should be kept alive to promote a successful prawn fishery in the two lagoons, on which quiet a large number of fishermen are dependent for their livelihood. The topographical studies indicate that the artificial breaching of the sand bar will allow natural flow of the water in and out of the lagoons as the depth in the lagoons are very much below mean sea level.

Acknowledgement

The authors are indebted to Mr. A. Philip, Divisional Fisheries Extension Officer, Mullativu and Mr. T. A. Rajapakse Lab, Assistant for their assistance in field work.

Reference

- DE BRUIN, G. H. P. (1970) The distribution of Penaeid Prawn in Ceylon waters. Bull. Fish. Rs. Stn. Ceylon Vol. 21 (2) pp. 67–73.
- SACHITHANANTHAN, K. and W. K. T. PERERA (1970). Topography and Substratum of Jaffna Lagoon—Bull. Fish. Res Stn. Ceylon Vol. 21 (2) pp. 75–85.
- SVEDRUP, H. U. et al (1942). The Oceans, their physics, chemistry and General biology. Prentice Hall Inc. N.J.U.S.A.