

A PRELIMINARY SURVEY OF 21 CEYLON LAKES*

I. Fisheries of two Lakes, Parakrama Samudra and Minneriya Wewa

By

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Introduction

Parakrama Samudra and Minneriya Wewa are large irrigation reservoirs in the North-Central Province. Surface area of Parakrama Samudra at full supply level is 5,590 acres and that of Minneriya Wewa 6,300 acres. These two lakes, being important freshwater fishing centres, were included in the survey that was carried out on some of the Ceylon lakes. Records of commercial fishing are available for these 2 lakes from 1957 onwards and an analysis of these was undertaken to provide a background for the survey.

The Food Fishes

Fifty-six species of indigenous fresh water fishes have been recorded from Ceylon (Deraniyagala 1952; Mendis 1954). Fourteen of these form the important food fishes in these two lakes. These fish include the local carps—*Puntius sarana*, *Puntius dorsalis* and *Labeo dussumieri*; the catfishes—*Heteropneustes fossilis*, *Ompok bimaculatus* and *Wallago attu*; the striped snake-head *Ophicephalus striatus* and the Cichlid—*Etilapia suratensis* which occur in sufficiently large numbers to support a small fishery. The other food fish occur in smaller numbers and do not form a regular fishery. They include the cat fishes—*Clarias teysmanni*, *Macrones keletius* and *Macrones vittatus*; the goby—*Glossogobius giuris*; the spinny eel—*Mastacembelus armatus* and the giant snake-head—*Ophicephalus marulius*.

Three non-indigenous food fishes are also found. *Tilapia mossambica*, first introduced to Ceylon in 1951 and stocked in these 2 lakes in 1953, occurs in such large numbers as to form a fishery in itself. Giant gouramy, *Osphronemus goramy*, occurs in fair numbers though it contributes little to the fishery. First introduced into Ceylon in 1900, the history of its subsequent spread has been recorded by De Zylva (1959). Common carp *Cyprinus carpio* has been recently stocked in these two lakes and appears occasionally in the catches.

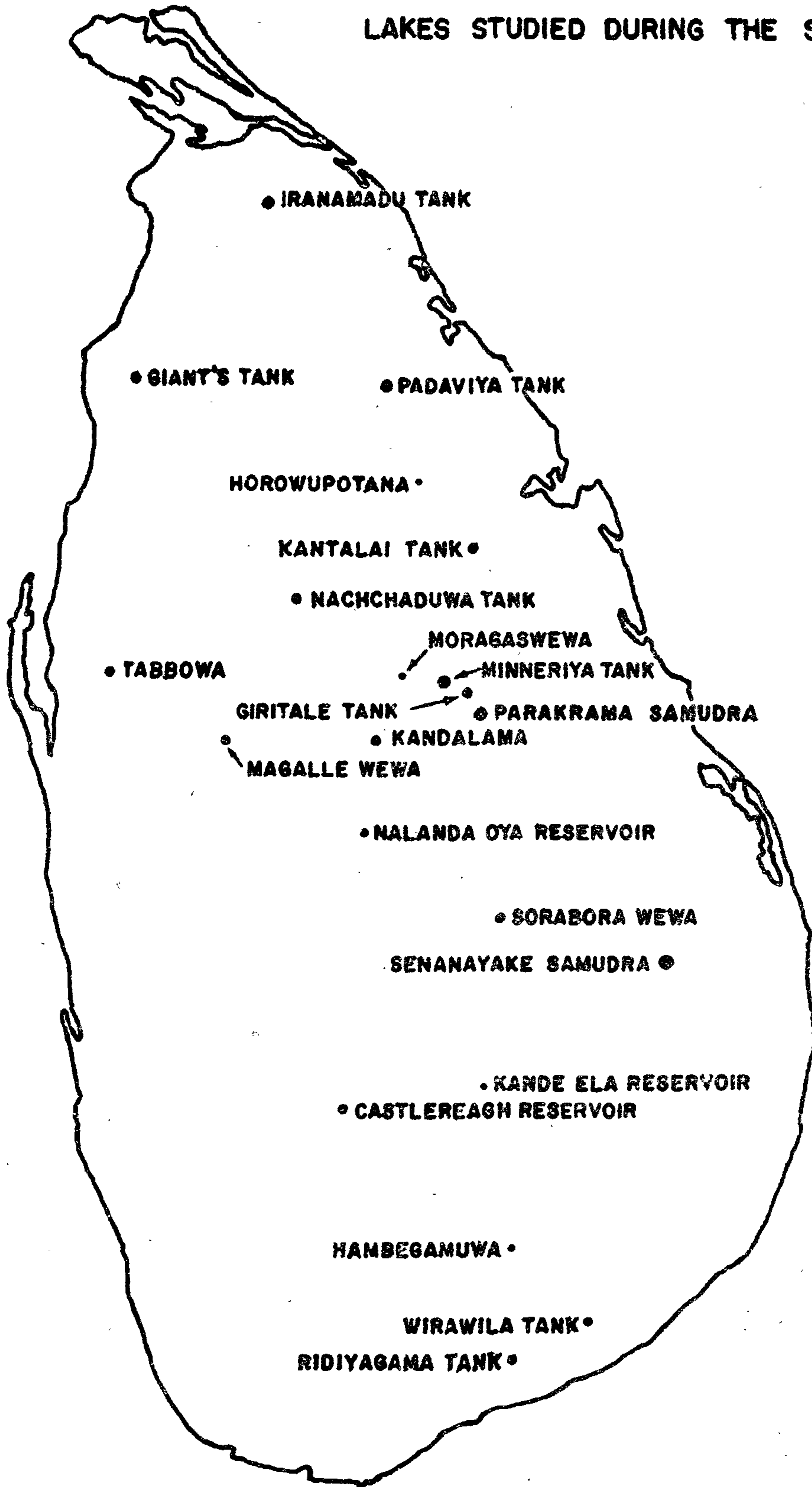
The Commercial Fishery

Fishing is done throughout the year in both these lakes, Parakrama Samudra being exploited mainly by fishermen who have settled around it, Minneriya Wewa by fishermen who migrate regularly to and from the sea coast. The main fishing gear used by all these fishermen are gill nets, shore seines (known as "Ma-del" nets) and cast nets.

Each gill net is about 125 to 150 fathoms long and about 1 to 4 fathoms in height. They are made of nylon; cotton nets being rarely used now. The mesh sizes vary from about 3½ inches to 6 inches depending on the type of fish that are to be caught. These nets are used either as drift nets

* The lakes surveyed are indicated in map on page 2.

LAKES STUDIED DURING THE SURVEY.



or more rarely as bottom set nets. The fish that are usually caught in them are *Tilapia mossambica*, *Labeo dussumieri*, *Eetroplus suratensis*, *Wallago attu*, *Ophicephalus striatus*, *Puntius dorsalis*, *Puntius sarana* and *Ompok bimaculatus*.

Shore-seines ("Ma-del" nets) are generally used for 4 to 5 months of the year when water levels are low, usually during the latter part of the year. These nets are similar to but smaller than the beach-seine nets used along the sea coast and described by Canagaratnam and Medcof (1956). Almost all species and sizes of fish can be caught by these nets. The advantage of using such a net is that fuller exploitation of the fish population is possible.

Cast nets are used in shallow areas reached either by wading or in a small boat. Fish usually caught are *Tilapia mossambica*, *Puntius* sp., *Ophicephalus* sp. *Macrones* sp. and *Glossogobius giuris*. A special modification of the typical cast net, having a series of small pockets around the periphery, is used by muslim fishermen at both these lakes to capture large numbers of the stinging cat fish *Heteropneustes fossilis*.

Analysis of Catch Data for 1957-62

Catch statistics from these 2 lakes were collected by an officer stationed at the fresh water fish breeding station at Polonnaruwa. Of the many fish landing places around each tank, the majority was fairly easily accessible by jeep and foot. Each of these was visited once a week, the visits being timed to coincide with the landing of the catch. On these visits the officer personally estimated the quantity and make-up of the catches, and he obtained from the fishermen the corresponding figures for the intervening period immediately before the visit. The fish landing places accessible only by boat were visited less frequently (about once a month); otherwise the procedure was the same.

Figures 1 and 2 show the total landings of fish from both lakes. The total landings at Parakrama Samudra in 1957 was 229,885 pounds. 1958 showed a reduction, the total landings being 147,477 pounds. This was due to most of the fishermen leaving the lake when their homes (fishing wadiyas) were destroyed or threatened with destruction by floods in December, 1957. They came back only during the latter half of 1958 when active fishing commenced again. The total landings increased slowly but steadily (Figure 1) from 1958 (147,477 pounds) to 1960 (302,000 pounds). Thereafter the increase has been very rapid, the year 1961 recording 533,960 pounds, and 1962 recording 657,800 pounds. This rapid increase is at least partly due to large numbers of fishermen migrating into inland lakes for fishing, some of them arriving at Parakrama Samudra and Minneriya Wewa. In 1957 the number of men fishing at Parakrama Samudra was about 14 whilst in 1962 this number had increased to about 68; and Parakrama Samudra has shown an increase of production from about 41 pounds per acre per annum in 1957 to about 117 pounds per acre per annum in 1962.

Minneriya (Figure 2) has shown a similar increase in the total landings. There was a slight increase from 1957 (70,000 pounds) to 1959 (244,525 pounds) with a slight decrease in 1960 (214,450 pounds). Thereafter the increase has been very rapid (for the same reasons given earlier for Parakrama Samudra) the year 1961 (638,800 pounds) showing treble the landings recorded for 1960. 1962 (744,000 pounds) shows a slight increase from that of 1961. The increase of production at this lake has been from about 11 pounds per acre per annum in 1957 to about 118 pounds per acre per annum in 1962.

The chief constituent in the fish landings at both places was *Tilapia mossambica*. Figures 1 and 2 show the proportion of *Tilapia* in the total landings at both places. In 1957, at Parakrama Samudra, *Tilapia* constituted 35 per cent. of the total landings and thereafter the percentage rose to between 80 and 87 per cent. except for the year 1960 when it was 73 per cent. At Minneriya catches of *Tilapia* alone for 1957 were not available, but from 1958 the percentage of *Tilapia* in the total landings was between 80 and 92 per cent., except for the year 1960 when it was 73 per cent. The rest of the catch (10 to 20 per cent.) at both places was made up mainly of *Labeo dussumieri* and *Eetroplus suratensis* with a small percentage (about 1 to 2 per cent.) of *Wallago attu*, *Ophicephalus striatus*, *Ompok bimaculatus* and *Osphronemus goramy*. The success of commercial fisheries at both these places was therefore due entirely to *Tilapia mossambica*.

PARAKRAMA SAMUDRA

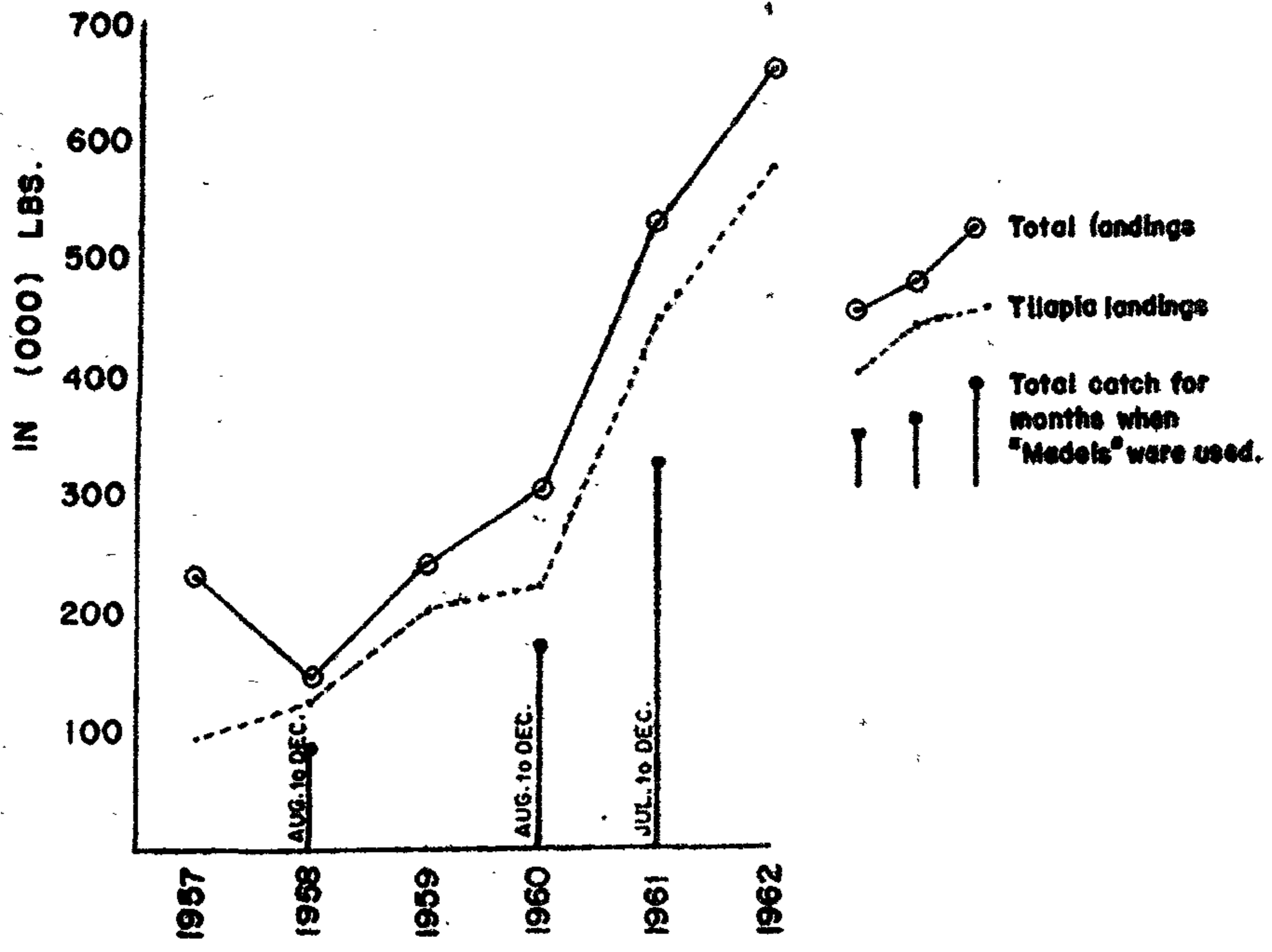


FIG. 1.

MINNERIYA TANK

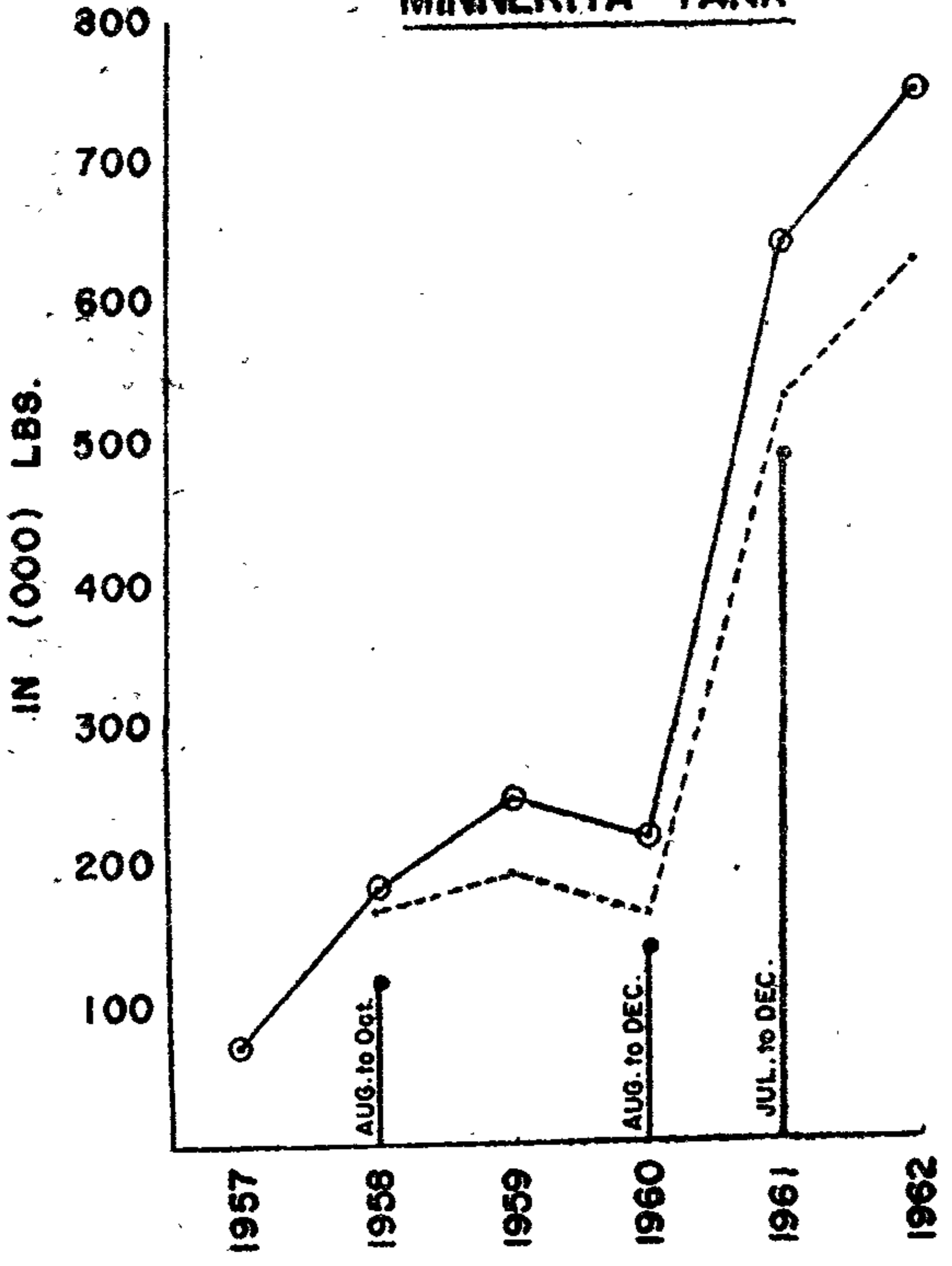


FIG. 2.

Figures 1 and 2 also show the total landings during the months when shore-seines ("Ma-del" nets) were used. The average monthly catch during these periods from each of these lakes has been consistently higher than the average for the whole year (as shown in Table 1). This is probably due both to a greater fishing effort in these months as well as to the fact referred to earlier, that the shore-seine ("Ma-del" net) permits of a less selective exploitation than the gill nets.

It is seen that the available catch data give no indication of over exploitation of the fish, resources of these two lakes. On the other hand the consistent and rapid increase in the landings since 1957 suggests that further intensification of the fishing effort can be undertaken. Records should be kept to note any tendency towards over-exploitation in the future.

Summary

Fourteen species of indigenous fish and 3 species of introduced fish commonly used for food are present in Parakrama Samudra and Minneriya Wewa. Commercial fishing is done throughout the year in these two lakes by gill nets, shore-seines ("Ma-del" nets) and cast nets. From records of fish landings maintained from 1957 it is seen that the production of fish at Parakrama Samudra has increased from 41 pounds per acre per annum in 1957 to 117 pounds per acre per annum in 1962; and at Minneriya Wewa from 11 pounds per acre per annum in 1957 to 118 pounds per acre per annum in 1962. *Tilapia mossambica* formed the chief constituent of the catch at both these lakes and it was due to this fish that the commercial fisheries at both these places were successful.

It is recommended that fishing effort be further increased in both these lakes and records be kept to note any tendency towards over-exploitation.

Acknowledgments

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TABLE 1

Average Catch per Month for Parakrama Samudra and Minneriya Wewa

Year	Lake	Average catch per month for the whole year, in pounds (L)	Average catch per month during shore-seine season only, in pounds (l)	Difference expressed as a percentage
				$\frac{l \times 100}{L}$
1958	Parakrama Samudra	12,289	22,946	187
	Minneriya Wewa	15,051	30,245	200
1960	Parakrama Samudra	25,166	33,660	133
	Minneriya Wewa	18,037	26,520	147
1961	Parakrama Samudra	44,496	54,491	122
	Minneriya Wewa	53,233	69,066	130