

# Demersal Fishery Resources of Sri Lanka and its Present Level of Exploitation with Special Reference to Off-Shore and Deep-Sea Waters

By

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During the early part of the 19th century the fishing industry in Sri Lanka was at a very low ebb. The British colonial government took a very serious view of this situation and did away with the centuries old fish tax and imposed an import duty on fish products brought into the island from abroad with the expectation of increasing fish production in the island. This did not meet with much success and it was only with the turn of this century that positive steps began to be taken to reorganize fishing industry in view of the ever increasing demand for fresh fish.

Bottom trawling as a method of fishing for demersal fish (ground fish) had been the backbone of the fishing industry in nearly all major fishing nations of the world. This continues to be so even today. In view of this, one of the first steps taken by the British colonial government was to look into the feasibility of starting a trawler fishery in the waters around Sri Lanka. With this end in view a survey for suitable trawling grounds was undertaken to operate large trawlers (100 ft.). The survey revealed that there were no suitable fishing grounds around the entire island for trawling. However, two banks namely the Wadge and Pedro Banks (see figure) not too distant from Colombo were found to be suitable and commercial trawling operations commenced in the 1920s.

In the 1950s through bilateral aid programmes several Canadian Master Fishermen carried out investigations on fish resources in coastal waters. They carried out several small boat trials and handling operations. The results of this work has been summarised by Medcof (1963).

In 1972, a Joint Soviet-Sri Lanka Survey of the 100-mile zone adjacent to Sri Lanka outside its territorial waters was carried out by the Soviet Research Vessel, SRTM 'Optimist'. Scientists from both countries were engaged in the survey. The main purpose of the survey was to investigate the fish resources and productivity of water adjacent to Sri Lanka. On the programme of this survey was a series of fishing trials using the bottom trawl. The survey was conducted outside the territorial waters of Sri Lanka, bottom trawling was only possible in limited areas on the edge of the continental shelf. Much of Sri Lanka's continental shelf lies within her territorial waters and hence no bottom trawling operations were done by the 'Optimist' in these areas. Areas where bottom trawling was possible were in the Gulf of Mannar, south of the island and on the Wadge and Pedro Banks.

In 1975, a survey by exploratory fishing of the coastal waters of Sri Lanka was conducted by the Japanese Marine Fishery Resource Research Centre (JAMARC) at the request of the government of Sri Lanka. Here too, scientists from both countries were involved in the survey. The survey included a study of the abundance and distribution of demersal fishes by hand line fishing. The area of operation included regions which are normally not exploited by local fishermen, due to their distance from the shore.

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### Wadge Bank

The Wadge Bank lies outside the Indian territorial waters off Cape Comorin. With the recent demarcation of the Indo-Sri Lanka maritime boundary it now falls within the Indian economic zone (see figure). The area exploited in the Wadge Bank up to about 1960 was approximately 3,000 sq. miles. With the operations of more trawlers the area fished was extended to 4,000 sq. miles. Trawling is also possible on the continental shelf north of the Wadge Bank along the western coast of India.

The fishing records of trawlers operating from Colombo in the Wadge Bank are extremely detailed and it has been possible to estimate the quantity of fish that would be harvested from these waters annually. In 1967 we were able to estimate that 15,000 tons of good quality fish could be harvested each year by trawlers operating on this bank. It was suggested that 20 trawlers similar in size to the ones being operated by the Ceylon Fisheries Corporation could exploit this resource. The introduction of these trawlers were to be spaced out over a 10-year period.

More recently in 1972, the survey carried out by the Russian Research Ship SRTM 'Optimist' was able to show that 5-6 trawlers of that class could operate on the Wadge and Pedro Banks to bring in 10-15,000 tons of fish annually.

At the conclusion of the Indo-Sri Lanka Maritime Boundary talks last year, India permitted Sri Lanka to fish in the Wadge Bank only up to 1979. Fishing by Sri Lanka trawlers in the Wadge Bank after 1979 will have to be by negotiation with the Indian Government.

### Pedro Bank

The Pedro Bank is an extensive shallow water plateau situated off the extreme north-east corner of the island stretching across the Palk Strait and extending some distance up the eastern coast of India. The bank covers an area of about 1,000 sq. miles. The recent demarcation of the Indo-Sri Lanka maritime boundary cuts across the bank and 1/3rd of the bank now lies in Indian waters.

Sri Lanka based trawlers not only operated in Pedro Bank proper but some distance northwards along the continental shelf of the east coast of India outside her territorial waters. This is no longer possible as the area now falls within the Indian economic zone.

The quantity of fish that could be taken annually from the Pedro Bank was estimated to be 2,600 tons. The report on the survey carried out by the 'Optimist' had lumped the quantity of fish that could be taken from this bank along with that of the Wadge Bank.

It was estimated that the fish stocks on the Pedro Bank could be exploited by 4-5 (100 ft.) trawlers. With the demarcation of the Indo-Sri Lanka boundary, 1/3rd of the bank now falls within the Indian waters. Moreover, we cannot fish in waters north of the Pedro Bank. Accordingly, it would be only possible to operate 2-3 trawlers on that part of the bank which falls within our waters. As in the case of Wadge Bank, it may be possible to negotiate with India to operate trawlers in their waters too in which case the number of trawlers could be increased to between 4 and 5.

### Mannar Bank

There is a small area in the Gulf of Mannar, which lies on our historic pearl banks, which is suitable for trawling. The Ceylon Fisheries Corporation has on a few occasions operated trawlers on these grounds although it is illegal to do so. The Pearl Fishery Ordinance prohibits even a fishing boat to sail over these grounds. However the resource on these grounds is considered to be limited and it would not stand a sustained fishery by large trawlers. If government decides to allow fishing in these grounds it could be fished by coastal fishermen operating hand lines rather than trawling.

### Deep-Water Trawling

In 1972, the SRTM 'Optimist' carried out a series of deep-water trawling trials outside Sri Lanka's territorial waters. Such trawlings were limited as only a very small part of the continental shelf lies outside Sri Lanka's territorial waters. Accordingly bottom trawling was only possible in the Gulf of Mannar at latitude 8°30' and on the continental slope in the south of Sri Lanka. Generally such trawlings were carried out at 200–350 metres depth. Beyond this the continental slope drops to abyssal depths. All such areas were found to have steeply sloping grounds and trawling was only possible along isobaths i.e., along ocean bed contours and these are generally parallel to the shore line.

Several species of fish were taken at depths between 200–350 metres. Many of them were of no commercial food value but could be used for fish meal. The species of fish that were commercially important were *Chlorophthalmus agassizi* and *Cubiceps* spp. Peak quantities of these were found in October to December and again in March and April. No estimate was made of the quantities of fish available in these deep waters.

In addition to fish several species of deep-water crustaceans—spiny lobsters (*Puerulus*) spp., shrimps and crabs were also found. While the lobsters and shrimps are of commercial importance the crabs found in these deep waters could only be used for production of fish meal. During the investigations, berried lobsters were found during all seasons with eggs at various stages of development. This indicates that they breed at all seasons and there is much investigations to be done on the biology of these species, before we could recommend the exact extent of the resource. Moreover, the 'Optimist' did not dredge on the continental slope within Sri Lanka territorial waters. Accordingly large extents of the continental slope around Sri Lanka has still to be surveyed. There is no doubt that when such a survey is carried out there would be indications of additional areas where trawling for deep-water lobsters, prawns and fish would be possible. At present this resource is not being exploited but for the present a trawler operating on the Pedro Bank could be diverted between March and June each year provided the trawler could trawl at depths up to 350 metres. Once a survey of the entire continental slope round the island is carried out the exact extent of the resource could be determined.

### Small Boat Trawling in Coastal Waters

Twin boat trawling by 'Teppams' using the 'Kattumaram dela' has been carried out along the north west coast during the past one hundred years or so. Accordingly, our fishermen have been resorting to trawling even before the introduction of large trawlers to the Wadge Bank. The types of ground fish available in coastal waters are relatively fast moving varieties compared to the slow moving flat fishes such as sole and flounder types typical of temperate waters. Accordingly the trawl net should be dragged along the bottom at greater speeds than the traditional 'Kattumaram dela.' However, the 'Kattumaram dela' had been able to bring in limited but sufficient quantities of small fish and prawns to keep their owners interested in this form of fishing.

Since 1953, surveys have been carried out to determine the feasibility of conducting small boat trawling in coastal waters. These surveys along with the motorization of the indigenous crafts and the introduction of mechanized boats for coastal fishing has paved the way for coastal trawler operations

in the southwestern, northwestern and northeastern coastal areas. Catches have been found to be encouraging particularly in Palk Bay where the yield per hour's trawling varies between 200 and 500 kg. Small boat trawling could be profitably carried out in the northeastern area going right up to the Pedro Bank and even exploiting the shallower area of the Pedro Bank proper. A large portion of the 2,000 tons of prawn available to the coastal fishing should be harvested by the small coastal trawlers.

Small boat trawling is an extremely skilled method of fishing. The boat operators should be in a position to handle their gear well. The net opening, length of warp, position of other boats, speed of trawling, etc., have to be constantly altered, depending on the fishing conditions, type of fish available on the grounds, etc.

Our trawling experience on the Wadge Bank has indicated that there have been seasonal migrations of pelagic fish to the sea bed. In fact the catches from the Wadge Bank have fluctuated seasonally as a result of large catches of Carangids (Faraw) and Jeela which are not true ground fish, entering the fishery. There has also been large seasonal catches of small sharks (dog fish). It is only a small portion of such fish that could be trapped in the bottom trawl net. The major portion of the shoal is generally well above the sea bed. The catches could therefore be increased by using a high opening trawl net or even by operating a pelagic trawl net just above the sea bed when it is known that such shoals are on the fishing grounds. Making use of acoustic depth recorders and fish finders, skilled fishermen could even operate such nets where, due to the nature of the terrain, bottom trawling is not possible. The extent of the resource has not yet been assessed, but surveys carried out indicate that there is a substantial resource to warrant the operation of small coastal trawlers.

#### Handlining for Ground Fish

Our fishermen operating from traditional craft such as the orus have been carrying out handlining operations for bottom fish in the past, and they continue to do so. With mechanization of the coastal fleet fishermen have been able to operate hand lines further away from the coast. In fact handlining grounds could not be operated before mechanization as such grounds were far from the shore, or were inaccessible to the traditional craft. Although handlining was carried out using hand lines with a single hook, catches could be increased by resorting to hand lines with multiple hooks.

There are areas on our continental shelf, where trawling is not possible even by small trawlers due to the nature of the sea bottom. In such areas, handlining could be conveniently carried out. A specific area is in the southeast sector of the island including the waters around the Little and Great Basses lighthouses. The JAMRAC survey of 1975 indicated unexploited resources of white snappers and flame snappers thirty or more miles from the shore in the north-east coastal sector. The survey also highlighted the presence of demersal fishes around the edges of the continental shelf in the southern waters of the island.

Bottom long-lining has also been carried out by our fishermen over a long period of time. These too could be developed further utilizing motorized craft with mechanical or hand-operated line haulers.

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## DISCUSSION

The question of deploying several trawlers to exploit the deep-sea lobster and prawn resources particularly in the Gulf of Mannar was raised. Mr. Mendis indicated that more survey work had to be carried out particularly within our territorial waters before we can provide a firm estimate of the deep-sea resources. Even part of the resources identified earlier by the " Optimist Survey " now lies within the Indian Economic Zone. It would therefore be best to operate only one trawler for this survey to start off with. This trawler in addition would do trawling in shallower grounds like the Pedro Bank, etc.

The possibility of the private sector getting engaged in research and obtaining financial assistance for the purpose was raised. A view was also expressed that the private sector could participate in research by providing the necessary information fish capture and landing statistics, area of operation of boats, etc. The suggestion was also made that Government controls the exploitation of fish resources. The Secretary to the Ministry of Fisheries said that the research was a job for the Research Division of the Ministry. Mr. Mendis said that besides data collected by the staff of the Research Division use had to be made of material gathered from any possible source. It was therefore absolutely necessary to get data from boat operators. Research would not only provide information on resources but also provide a basis for the management of the resource.

The question of development of off-shore and deep-sea fishery and its effect in the position of the poor coastal fishermen was raised. As an example it was pointed out that the construction of the Mirissa Fisheries Harbour had wiped out a number of small fishermen from the area. The Secretary to the Ministry of Fisheries indicated that while taking steps to develop off-shore fisheries, consideration will be given to see that the needs of the small-scale fisheries and since this was an important topic it was decided to arrange another symposium solely devoted to small-scale coastal fisheries.

The problem of foreign boats poaching in our waters in the Palk Bay was raised. The Secretary indicated that at present the co-operation of the navy is sought in the apprehension of these fishing boats and action is also being taken to adjust the existing laws regarding this matter.

The question of pollution was also discussed along with the necessity to preserve our fish resources.

