

The Development of Trawl Fisheries in Southeast Asian Countries as A Means of Increasing Marine Fisheries' Production

KLAUS TIEWS

*Institut für Küsten - und Binnenfischerei der
Bundesforschungsanstalt
Hamburg, Federal Republic of Germany*

Abstract

Under a bilateral agreement, the Federal Republic of Germany has assisted Thailand to develop its marine fisheries through the introduction of trawl net fishing. This has increased production by 145,000 tons doubling the marine fisheries yield in 4 years (1960 = 146,000 tons; 1963 = 323,000 tons). In 1963, there were 2,327 registered trawlers, 650 of cutter size (more than 15 m in length), while the others were smaller boats. In the opinion of the author an increased fisheries production of some 1-2 million tons of demersal fish can easily be achieved in Southeast Asia, provided the trawl fisheries could be fully developed in the following countries: Cambodia, Malaysia, Indonesia, Burma, East Pakistan, India, Vietnam, and Ceylon. Trawl fisheries are non-existent or only slightly developed in these countries.

THE SPEEDY DEVELOPMENT of fisheries is one of the main concerns of all Southeast Asian countries, as more protein food is needed for their rapidly increasing populations. In view of this it is surprising to learn that one of the most important fishing methods in the world, trawling, is unknown there. Until 1960 only the Philippines had a fully developed trawl fishery, yielding annually some 50,000 tons. Lack of suitable trawling grounds restricts the trawl fishery to its present size. Apart from the Philippines, the old Chinese method of bull (pair) trawling with Chinese junks has in recent years expanded from the Gulf of Tonkin to Vietnam, the west coast of India, and Ceylon. No commercial trawl fishery existed in any other Southeast Asian country until 1960. Until then only a few trawling experiments had been made, as in Indonesia, where FAO had assisted in a program on shrimp trawling from 1956-1958, and in Singapore.

The benefit to Southeast Asian countries from the development of trawl fisheries shall be shown using Thailand as an example. Under a bilateral agreement for economic and technical cooperation between the Federal Republic of Germany and the Kingdom of Thailand, arrangements were made with the Thai Department of Fisheries to introduce otter trawling into the Gulf of Thailand. This program, after the development of suitable gear, showed the economic feasibility of trawling and subsequently the method was systematically introduced. Another major objective was to advise the Thai Department of Fisheries on the scientific management of the bottom fish resource and to assist in distribution studies.

The program was carried out in two phases from May 23 to September 11, 1961, and from July 27, 1962, to October 9, 1964. A total of 23 research cruises, comprising 471 hauls amounting to 822 trawling hours, demonstrated that there are excellent possibilities for a commercial trawl fishery along the

entire coast of the Gulf of Thailand in depths to 50 m. The trawling grounds cover an area extending up to 70 miles from shore.

The overall average catch per hour of the standard trawl (Fig. 1) amounted during the 1963-1964 survey to 248.9 kg, and was thus a little lower than

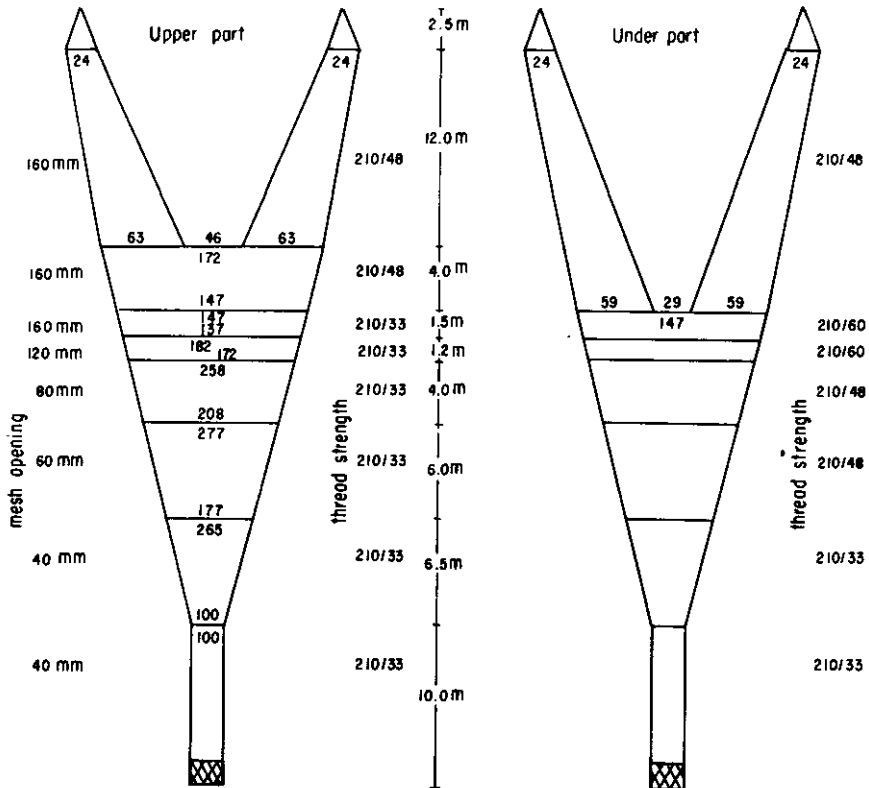


FIG. 1. Standard otter board trawl used (the thread strength is given according to international titer, in Denier). (Tiews, 1965)

that obtained in 1961, when 297.8 kg were caught. Of the catches 57% were fish for human consumption and 43% of use for industrial purposes such as duck food. The good fishing results permitted commercial trawlers of some 20 m in length to make monthly catches of 40 metric tons of fish (4,000 US\$), and the trawl fishery has expanded. During the period from 1938 to 1960 the Thai fisheries' production was stagnant between 161,000 tons (1938) and 235,000 tons (1957). Fisheries' production reached 418,000 tons (79 million US\$) in 1963. The increase has been mainly due to the rapid trawl fisheries' development, which yielded some 145,000 tons in 1963. The calculated catch

composition by species is given in Table 1. There were 2,327 registered trawlers in 1963, from which about 650 were of cutter size (more than 15 m

TABLE 1

SPECIES COMPOSITION OF TRAWL CATCHES BASED ON THE COMPOSITION OF EXPERIMENTAL TRAWL CATCHES MADE BY RV PRAMONG 2 IN AREAS I-V IN % AND 1,000 TONS FOR 1963

| Species | % | 1,000 tons | Species | % | 1,000 tons |
|-----------------------------------|------|------------|--------------------------------|-------|------------|
| <i>Leiognathus</i> sp. . . . | 23.9 | 34.6 | <i>Triacanthus</i> sp. | 0.8 | 1.2 |
| <i>Caranx</i> sp. | 10.3 | 14.9 | <i>Lutjanus</i> sp. | 0.7 | 1.0 |
| <i>Nemipterus</i> sp. . . . | 9.2 | 13.3 | <i>Rastrelliger</i> sp. . . . | 0.5 | 0.7 |
| <i>Upeneus</i> sp. | 7.7 | 11.2 | Crabs | 0.5 | 0.7 |
| <i>Sciaena</i> sp. | 6.3 | 10.3 | <i>Plectobranchnus</i> sp.. | 0.4 | 0.6 |
| <i>Saurida</i> sp. | 6.3 | 9.2 | <i>Epinephelus</i> sp. . . . | 0.4 | 0.6 |
| <i>Scolopsis</i> sp. | 4.0 | 5.8 | <i>Selaroides</i> sp. | 0.3 | 0.4 |
| <i>Priacanthus tayenus</i> | 3.6 | 5.2 | <i>Trichiurus baumela</i> | 0.3 | 0.4 |
| <i>Sepia</i> and <i>Loligo</i> .. | 3.2 | 4.7 | <i>Penaeus</i> sp. | 0.3 | 0.4 |
| Tarpon | 2.7 | 3.9 | <i>Fistularia</i> sp. | 0.3 | 0.4 |
| Rays and Skates .. | 2.4 | 3.5 | <i>Pomadasy</i> sp. | 0.2 | 0.3 |
| <i>Tachysurus</i> sp. . . . | 2.0 | 2.9 | <i>Scomberomorus</i> sp.. | 0.2 | 0.3 |
| <i>Sphyaena</i> sp. | 1.3 | 1.9 | <i>Caesio</i> sp. | 0.2 | 0.3 |
| <i>Thunnus</i> sp. | 1.1 | 1.6 | <i>Lactarius lactarius</i> .. | 0.2 | 0.3 |
| Sharks | 1.0 | 1.5 | <i>Pampus argentus</i> .. | 0.1 | 0.1 |
| <i>Atropus atropus</i> .. | 0.8 | 1.2 | <i>Polynemus</i> sp. . . . | 0.1 | 0.1 |
| | | | Other fishes | 7.9 | 11.5 |
| Totals | | | | 100.0 | 145.0 |

in length), while the others were smaller boats. A detailed report on the bottom fish resources investigation in the Gulf of Thailand is given by Tiews (1965).

It is most astonishing to observe that such a rich fish resource has been completely overlooked in Thailand and is being still overlooked in other Southeast Asian countries, while the landings of the marine fisheries in many of these countries are stagnating (Table 2). In the opinion of the author, Cambodia should have similar possibilities to build a commercial trawl fishery in the Gulf of Thailand as Thailand has done. Malaysia, having started to copy the success of the Thai trawl fishery could also expand her trawl fishery to the southern parts of the Gulf of Thailand. Indonesia may have favorable conditions for a large scale commercial trawl fishery in its archipelago as the low depth of the Indonesian inter-island waters indicates. Burma, East Pakistan, and India could develop larger trawl fisheries in the Bay of Bengal, as the experimental trawl fishing experiments of FAO demonstrated. Vietnam, too, should have considerable possibilities for a further expansion of her trawl fishery. Some possibilities to expand the trawl fisheries exist also for Ceylon. She could develop a coastal baby trawl fishery, initiate a trawl fishery on the Pedro Bank and further intensify her Wadge Bank fishery (Tiews, 1963).

In summary: The potential of the demersal fish resource is generally less known in Southeast Asia than that of the pelagic fish resource, as the example of Thailand demonstrates. Most of the countries in Southeast Asia possess

TABLE 2

LANDINGS OF MARINE FISHERIES OF SOME SELECTED ASIAN COUNTRIES IN 1,000 TONS (ACCORDING TO FAO-YEARBOOK OF FISHERY STATISTICS 1952-53, 1957, 1961 AND 1963) AND (TIEWS, 1965).

| | 1950 | 1951 | 1952 | 1953 | 1954 | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1963:1950 | 1963:1960 |
|--------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------|-----------|
| Burma ¹⁾ | ... | ... | ... | ... | ... | ... | 360 | 360 | 360 | 360 | 360 | 360 | 360 | 360 | 1.00 | 1.00 |
| Cambodia ¹⁾²⁾ | ... | ... | ... | ... | 150 | 150 | 150 | ... | ... | ... | ... | 148 | 146 | 157 | 1.05 | ... |
| Ceylon | 43 | 37 | 26 | 26 | 30 | 31 | 40 | 39 | 41 | 47 | 51 | 71 | 79 | 88 | 2.04 | 1.72 |
| China (Taiwan) .. | 60 | 79 | 92 | 92 | 142 | 170 | 151 | 162 | 181 | 200 | 210 | 255 | 290 | 313 | 5.21 | 1.49 |
| Hong Kong | 31 | 31 | 35 | 32 | 46 | 45 | 54 | 64 | 67 | 64 | 61 | 52 | 57 | 58 | 1.87 | 0.95 |
| India | ... | ... | ... | 582 | 588 | 596 | 719 | 875 | 756 | 585 | 880 | 684 | 634 | 647 | 1.12 | 0.74 |
| Indonesia | ... | 324 | 365 | 375 | ... | ... | 418 | 406 | 421 | 400 | 410 | 422 | ... | ... | 1.30 | ... |
| Malaysia | 123 | 119 | 119 | 121 | ... | ... | 113 | 113 | 114 | 121 | 142 | 153 | 187 | 217 | 1.76 | 1.53 |
| Pakistan | ... | ... | ... | 97 | 96 | 102 | 108 | 90 | 91 | 94 | 109 | 102 | 107 | 111 | 1.15 | 1.06 |
| Philippines | 195 | 266 | 282 | 272 | 309 | 326 | 355 | 348 | 369 | 378 | 384 | 387 | 386 | 485 | 2.48 | 1.26 |
| Thailand | 136 | 141 | 139 | 149 | 170 | 155 | 152 | 166 | 145 | 148 | 146 | 233 | 270 | 323 | 2.38 | 2.22 |

¹⁾ The statistic does not separate marine and inland fisheries.

²⁾ Most of the production will be from inland fisheries.

much better trawling grounds than are presently known. An increase of some 1-2 million tons of demersal fish, if not more, could easily be achieved in Southeast Asia, if the trawl fisheries were fully developed. Also the utilization of the demersal fish resource in the tropical waters of Southeast Asia will reach in some areas, as in Thailand, an importance which might exceed that of the pelagic fish resource.

The author believes that one of the main reasons for the late development of a commercial trawl fishery in Thailand lies in the isolation under which nearly all countries in the region develop their fisheries. Otherwise it could not have been possible that certain types of fishing gear, used with great success in one country, are completely unknown in others, even though the available fish resources and the behavior of the fish to the fishing gear are exactly or nearly the same. In the Philippines the most important fishing gear had been the trawl net and the bag net (basnig). Until 1959 both were unknown in Thailand and in many other countries in the region. At the same time, in Thailand the most important fishing gear was the purse seine, rarely found in the Philippines. The purse seine in combination with the light-luring technique as used in basnig fishing, has become a very effective fishing gear in Philippine waters and has been rapidly adopted since 1960. Cooperation between the countries in the regions should be strengthened. The marine fisheries research work in the area should concentrate in the next few years on resources surveys and as an initial step should introduce in each of the countries concerned, all the different types of fishing gear used as sampling gear, needed to perform such surveys. These surveys should also include the assessment of the size of the mollusc stocks since it is felt that their cultivation might provide other urgently needed protein resources.

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