

THE STATUS OF THE HONG KONG TRAWLING INDUSTRY

by

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ABSTRACT

This paper is based on the personal knowledge and observations of the writer and is intended to serve as a companion to an Inventory of Demersal Fisheries in Hong Kong, also written by Mr. Au.

INTRODUCTION

The Hong Kong trawling industry has gone through a series of developmental changes in the past two decades. Today, as a result of these changes, its fleet has gradually become adequately efficient and mechanized. However, this result is by no means the end of technological development, because the recently introduced stern-trawlers have stimulated the interest of the conservative fishermen, and consequently steered the attention of these primary producers in the direction of modern methods of fishing. It can therefore be said that technological development has just begun, and accordingly that there are still good prospects for further development of the trawling industry.

In order to appreciate the present status of the industry, a brief summary of its history is very much in order.

HISTORICAL BACKGROUND

Sailing period

Up till late 1940's, Hong Kong was only a port of call for deep-sea (or distant) junk trawlers fishing along the coast of South China. These trawlers stopped over in Hong Kong merely for the purpose of disposing their catches and of reprovisioning. They depended on the wind for power. The grounds fished changed from season to season, controlled by the two monsoons and their inter-seasonal periods, but not the biological behaviour of the species.

Mechanization period

In 1948, a fishing company began to introduce into Hong Kong the Japanese type of mechanized bull-trawlers, and the champion local trawlerman was also induced to motorize his pair of junk trawlers with the aid of a loan from the Fish Marketing Organization. By 1951, the Japanese type bull-trawlers had increased to 14 pairs. Unfortunately, due to poor management and to lack of experienced crews, this company became economically unsound and had to be dissolved. However, the introduction of these vessels, stimulated the interest of local fishermen, and the trawling industry began to gradually enter an era of mechanization. This is a very significant chapter in the technological development of the Hong Kong fishing fleet.

In the initial period of mechanization, attempts were merely confined to the installation of engines in existing vessels. This situation had, however, presented many technical problems. For instance, most of the hulls of vessels were found to be too weak to withstand higher speeds made possible by mechanical propulsion or to withstand the vibrations generated by engines. Mechanization, therefore, was initially not of much benefit to fishing operations.

In view of this situation, the Government began a mechanization scheme, in which technical and financial aids were made available to the fishermen. Through the cooperation between the fishermen and Government a series of major changes took place. A fundamental change was in the basic shape of the hull which altered from high stern and low bow to lower stern and higher bow. This change, coupled with some modern structural features, enabled local vessels to benefit from diesel-propulsion and to increase their maneuverability. However, the fishing method and the design of trawl nets remained basically unchanged until a few years ago when the Government succeeded in getting fishermen interested in stern otter-trawling.

Technical assistance

Training of fishermen. Mechanization created a demand for qualified masters and engineers amongst the fisherman population. To cope with this situation, the coxswain class was organized in 1951, the engineer class set up in 1954, and the skipper class commenced in 1955. In 1960, the latter was re-designated as the navigation class in order to introduce to fishermen modern navigational techniques, and subsequently to enable the rapid development of middle and distant-water mechanized trawlers. Concurrently, special instruction courses were given to vessel builders for the purpose of ensuring the proper planning and building of mechanized fishing vessels.

Improvement of fishing vessels. When the installation of engines in the traditional junk trawlers proved to be successful, attention was drawn to the improvement of the vessel design. Many of the defects were streamlined. The newly built trawlers were mostly constructed with better-shaped sterns, thereby eliminating the customary "A" brackets which used to support the long projection of the propeller shaft. The bulbous stern of the traditional junk was drastically reduced to make room for better flow of water to achieve greater efficiency for the propeller.

A modified junk trawler was first introduced to the local fishermen in 1963. It differed from the traditional junk lay in that the stern was raised and a forecastle was built to accommodate the crew. The deck lay-out was also greatly improved. The poop aft was left out to enable more clear stern on the deck, facilitating efficiency in shooting and hauling of gear. The vessel was fitted with a steel rudder, wheelhouse and bridge control. Though this modified trawler was not built according to plan, a number of templates were used.

Over the next few years, gradual improvements in the hull form and the construction of trawlers took place, but complete drawings for the entire vessel were still not possible. The first vessel built with a detailed design drawing and weight calculation was constructed in 1965. It was a 66 foot (20.11 m) L.O.A. prototype stern trawler. The new idea was accepted by the fishermen and, with the aid of Government loan, the project was completed. Soon after this the first unit of completely designed 86 foot (26.21 m) L.O.A. pair-trawlers were built. These modern boats exhibited excellent performance and sea-worthiness, and led to wide-spread adoption of the clear-stern hull form for long-lining as well as trawling.

At present, all the local pair-trawlers are equipped with power-driven windlasses and semi-balanced steel rudders instead of the original large wooden sailing rudders. Even wheelhouse and bridge controls are found on some of the trawlers.

Apart from her completely clear stern and construction to design drawings, the introduction of a stern trawler to the local industry in 1965 also marked a further significant advancement in the technological development of the trawling industry. This prototype 66-foot (20.11 m) stern trawler was designed and financed by the Government for one of the prominent local fishermen. This vessel has a clear stern, with modern hull form, and is powered by a 200 b.h.p. diesel engine. In order to keep the cost to a minimum, much of the construction has been done by local methods, supplemented by full frames and templates to obtain a good hull form. In addition, the boat has a modern belt-driven trawl winch, complete with separate dog clutches and brakes for each drum, warping ends, guiding-on gear, control bollards and gallows, which are entirely new to the local fishing fleet.

This new method of fishing has proved to be a great help. It requires 6 to 7 men in operation instead of 12 or more men in each vessel in pair-trawling. The catch rate has been particularly impressive because the catch comprises a high percentage of large-sized fish. Fishermen began to realise the advantage of fishing by otter trawling. By the end of 1967, the Hong Kong fishing fleet found an addition of 8 modern stern otter trawlers and 10 modified stern otter trawlers: by mid 1968 the total number of stern trawlers had increased to 28. The size of these stern otter trawlers ranged from 66 ft. (20.11m) to 80 ft. (24.38m) while the horse-power of the engines ranged from 200 to 300 (twin engines).

In these modern trawlers, modified fish holds were also installed. A two inch thick polystyrene foam was put on the sides and the floor of the fish room and a three inch thick one was put under the deck-head to obtain the greatest increase in thermal efficiency. The floor was also covered with cement concrete, with drainage into a sump kept empty by the bilge pump. Vapour barriers to provide adequate ventilation between the outside of the hold and the shipside is also provided: this is also a preventive measure against rot setting in.

Other local fishing trawlers also have insulated fish holds. But their designs are very much simplified and crude, so usually they cannot match the above-mentioned one.

Practical demonstration on fishing method and gear. To introduce the modern otter trawler to the local fishermen, Technical Officers of the Department give instructions in the making and rigging of the new types of nets and teach the crew how to handle the new equipment. Training sessions take place on board the new vessel within territorial waters for about a week, after which the new vessel is turned over to the fisherman-owner for commercial fishing in the proper fishing ground.

Apart from training him in navigational techniques, the department is also introducing to the fisherman modern equipment such as the marine compass, echo sounder wireless direction-finder and other necessary navigation equipment. They are means to enable our fishermen to sail beyond their traditional fishing grounds in search of more profitable grounds in deeper and more distant waters.

Financial assistance

Information available to the Department show that about 95% of the Hong Kong fishing fleet is owner-operated, while the remainder are owner-directed by fish dealers and fishing companies. Hong Kong fishermen are very conservative, and they seldom accept new techniques which have not been fully demonstrated to them by the Government. It is quite obvious that without financial assistance from the Government

and the Fish Marketing Organization, the development of the trawling industry could not have been carried out so thoroughly and effectively within such a short time.

Fish Marketing Organization Loan Fund. This Fund which now has a ceiling of 3 million Hong Kong dollars (US\$500,000) was established in 1946 with the intention of making short to medium term loans to fishermen for productive purposes. These include the maintenance and repair of vessels and engines, the construction of new vessels, and the purchase and installation of engines. Loans totalling HK\$25 million have been issued to date and HK\$23 million repaid. This loan fund played a most important role during the mechanisation of the trawler fleet.

Fisheries Development Loan Fund. This loan has a revolving capital of HK\$5 million (US\$825,000) and was established by the Government in 1959. The purpose of this loan fund is to develop the mid-distant and off-shore fishing fleet, particularly by providing financial assistance for fishermen to install larger engines in under-powered vessels, to construct new mechanised deep-sea vessels and to build modern fishing craft designed by the department. Loans totalling HK\$7.4 million have so far been issued to 51 fishermen 50 of whom were trawlermen, for purchasing engines, for modifying their vessels and for building modern boats. The largest singleboat loan has amounted to HK\$287,000 for the building of an 86 ft. L.O.A. (26.21m) big long-liner. The largest trawler loan was HK\$439,000 for the prototype unit of 86 ft. (26.21m) L.O.A. pair trawlers.

PRESENT STATUS OF THE INDUSTRY

The local fishing fleet, with 6,800 vessels, is operated by 56,000 fishermen. In all, 28% of the vessels are trawlers. The total 1967 landings of marine fish by Hong Kong fishermen amounted to some 1,200,000 piculs (73,000 m.t.) including 917,841 piculs (55,492.20 m.t.) marketed through the Fish Marketing Organization. It is estimated that about 49% of the total landings were attributable to the trawler fleet. In addition, the landings of prawns from shrimp beam trawlers were estimated to be about 175,000 piculs (10,600 m.t.).

The details of Hong Kong's trawler fleets, shown in relation to all vessels exploiting demersal resources, are set out in Appendix 1.

Fishing Gear

The steel trawlers operated by fishing companies are using the Japanese 'BULL' trawl net and the stern trawlers the North Sea otter trawl nets. The local pair-trawlers and shrimp beam trawlers still retain the traditional net designs, however, with a certain modification. All these nets are now made of synthetic fibre netting,

ropes, with plastic floats and combination ground rope of steel wire and nylon ropes. Description of the gear used by local pair-trawlers are given in Appendix 2.

Fishing ground

The fishing grounds of the local trawlers cover a considerable area on the continental shelf off the coast of Kwangtung extending from 109° 15' to 116° 30'E and 17° 20' to 22° 15'N at a depth ranging from 30 to 70 fathoms (55 to 128 m). As shown in the map at Appendix 3, the deep sea trawlers occasionally, especially in spring and autumn, fish in Area A off Kap Tse and Ping Hoi at a depth of between 40 to 60 fathoms (73 to 110m). Area B off Ladrone Islands and St. John Islands between the depth of 30 to 60 fathoms (55 to 110 m) is the fishing ground of the deep sea trawlers during the typhoon season in summer. The inshore trawlers usually confine their activities to areas A and B between the depth of 25 to 40 fathoms (46 to 73m). Area C is the main fishing ground for the deep sea trawlers throughout the year, except when there is a typhoon warning. At times they extend their activities to Area D.

The company operated trawlers used to fish in the Gulf of Tongking, but the Vietnam War has now prevented this. At present they concentrate their fishing activities in Area D.

In Area E off Kap Tze and Tsat Por, at a depth of up to 25 fathoms (46m) prawns may be found. This is the fishing ground of the shrimp beam trawlers. The stern otter trawlers fish in the C area off Tsat Por and Taya Island within the depth of 40 fathoms (73m).

APPENDIX 1

Type of Vessel	Length		Breadth		Capacity*		Engine b.h.p.	No. of Vessel
	foot	metre	foot	metre	Reg. piculs	Net Reg. tons		
Deep-sea Trawler	65 - 82	19.9 - 25.0	19 - 25	5.8 - 7.6	1,502 - 3,221	61.8 - 132.6	150 - 272	70
Inshore Trawler	56 - 63	17.1 - 19.2	17 - 20	5.2 - 6.1	1,019 - 1,555	42.0 - 64.0	150 - 272	248
Boam-trawler	38 - 66	11.6 - 20.1	12 - 21	3.7 - 6.4	339 - 1,795	13.9 - 73.9	48 - 150	1,564
Deep-sea Long-liner	58 - 75	17.7 - 22.9	18 - 25	5.5 - 7.6	1,148 - 2,826	47.3 - 116.4	114 - 224	10
Medium Long-liner	37 - 50	11.3 - 15.2	13 - 18	4.0 - 5.5	367 - 938	15.1 - 38.6	48 - 144	100
Small Long-liner	26 - 36	7.9 - 11.0	9 - 13	2.7 - 4.0	125 - 352	5.1 - 14.5	7 - 60	755
Gill-netter	26 - 48	7.9 - 14.6	9 - 15	2.7 - 4.6	125 - 671	5.1 - 27.6	7 - 72	2,142
Stern-trawler	66 - 80	20.1 - 24.4	20 - 23	6.1 - 7.0	1,664 - 2,727	68.5 - 112.3	200 - 300	18
Company Operated Steel Trawler	86 - 94	26.2 - 28.7	17 - 18	5.2 - 5.5	1,803 - 2,227	74.2 - 91.7	270 - 310	10

* The capacity for all local wooden fishing vessels is calculated according to the Thames Measurement, while that of steel trawlers to the instructions as for the tonnage measurement of ocean-going ships.

$$\text{Reg. Capacity} = \text{Thames Measurement} \times 17$$

$$= \frac{(L-B) B^2}{188} \times 17 \text{ piculs}$$

$$\text{Net Reg. Tons} = \text{Thames Measurement} \times 0.7$$

$$= \frac{(L-B) B^2}{188} \times 1.7 \text{ tons}$$

Summary situation of Hong Kong fishing vessels exploiting demersal resources

APPENDIX 2

Types of gear employed by Hong Kong pair-trawlers

Type of pair-trawlers	Length of Head-rope	Plastic Floate		Net Proper											
				Wing				Belly				Cod End			
				Size (diameter)	No.	Twine size (ply)	Mesh size	No. mesh	Length	Twine size (ply)	Mesh size	No. mesh	Length	Twine size (ply)	Mesh size
Deep-sea trawler engaging in deep-sea fishing. (200 - 240 H.P. engine)	31 fathoms (56.7 m)	8 inches (20.3 cm)	32	39	4 3/4 inches (12.1 cm)	340 - 66	95 ft (29.0 m)	30 - 39	4 3/4 - 3 inches (12.1-7.7 cm)	680 - 200	81 feet (24.7 m)	56	2 1/2 inches (6.3 cm)	200 - 200	36 feet (11.0 m)
Deep-sea trawler engaging in inshore fishing. (200 - 240 H.P. engine)	44 fathoms (80.5 m)	8 inches (20.3 cm)	40	30	6 1/2 inches (16.5 cm)	390 - 50	138 ft (42 m)	24 - 60	6 1/2 - 3 inches (16.5-7.6 cm)	780 - 220	134 feet (40.9 m)	60	2 1/2 inches	200 - 220	36 feet (11.0 m)
Inshore trawler (174 H.P.)	26 fathoms (47.6 m)	6 inches (15.3 cm)	28	24	4 1/2 inches (11.4 cm)	350 - 84	78 ft (23.8 m)	21 - 24	4 1/2 - 3 inches (11.4-7.6 cm)	700 - 220	94 feet	60	1 5/8 inches (4.3 cm)	220 - 220	21 feet (6.4 m)
Inshore trawler (72 H.P.)	20 fathoms	6 inches (15.3 cm)	22	24	4 3/4 inches (10.8 cm)	340 - 140	62 ft (18.9 m)	21 - 24	4 3/4 - 3 inches (10.8-7.6 cm)	680 - 220	81 feet (24.6 m)	69	1 7/8 inches (3.8 cm)	200 - 200	18 feet (5.5 m)

