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TUNA INDUSTRY IN THAILAND

by
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I. PREFACE

Recently the tuna canning industry in Thailand has been developing rapidly. In 1986, I was fortunate to have an opportunity to visit one of the tuna canneries here. The visit and my role as an instructor of the Training Department of the Southeast Asian Fisheries Development Center (TD/SEAFDEC) encouraged me to write this book, as I believe it will help our trainees to understand the fishery of Thailand, a leader in the industry in the Southeast Asian region.

Until 1985 SEAFDEC ran two-year regular training courses in engineering and fishing technology. However, in order to meet the strong demands of member countries, the length of the training period was cut to one-and-half-years in 1986 and one year after 1988. With the shorter courses more emphasis will be placed on practical training rather than theory.

In line with the above-mentioned policy, I intended to write a book for practical use to help our trainees to understand the fundamentals of the fishery business whose principles are to obtain a good catch, sell at a high price and make a profit.

An increase of 30 per cent and 37 per cent in the annual world tuna production was attained during the six years from 1970 to 1975 and the 10 years from 1975 to 1984, respectively. Although due to a stagnant period from 1980 to 1982 the annual growth of the latter period is lower than the former period, production has steadily increased (See Annex 3). The total production of the main tuna species, excluding marlin, mackerel tuna and longtail tuna was approximately 2.1 million tons in 1984, and including those three species was roughly estimated at 3.0 million tons. It represents 4 per cent of the total world catch (80 million tons/year) (See Table 1).

Table 1: World catch of major tunas, 1977-1983, in 1000 MT.

Year	SKJ	YF	BE	ALB	NBF	SBF	Total
1977	641	576	235	191	43	42	1728
1978	839	575	223	215	40	35	1927
1979	731	548	206	192	41	39	1757
1980	796	548	229	180	36	45	1834
1981	747	608	201	185	47	45	1833
1982	794	573	213	201	48	42	1871
1983	924	604	213	170	39	42	1992
1984	(1050)	(599)	(190)	(186)	(35)	(38)	(2099)

Source : FAO FISHDAB

Note : A. SKJ : Skipjack

YF : Yellowfin

BE : Bigeye

ALB : Albacore

NBF : Northern Bluefin

SBF : Southern Bluefin

B. Data for 1984 are preliminary estimations and are given in parentheses.

Tuna is one of the main sources of protein in the world. According to consumers' tastes, it can be eaten raw or processed. Of the total production 80 per cent is canned.

Thailand has distinguished itself among producing and exporting countries of canned tuna since the end of 1970. In 1984, it rivaled Italy in third place and in 1985 took third place after Japan in second and America in first. There is every indication that in the near future, to be specific, in 1986, it will surpass Japan.

Thailand, the Philippines, Ivory Coast and Senegal, are key members of the 20 tuna producing countries in the world. What these four also have in common is that most of their production is exported to other countries. The main market for Thailand and the Philippines is North America and West Europe, and that of Ivory Coast and Senegal

is France, their former sovereign state. With regard to these countries, except Thailand, their increased production rate compared with a previous year is 26 per cent at best and -12 per cent at the worst during these years. On the other hand, the production of Thailand has increased remarkably year by year with a maximum production rate of 111 per cent and a minimum of 42 per cent. It is a noteworthy fact that, besides the effort and strong will of the industry in Thailand, a global situation encouraged the record growth over a short period.

In preparing this book, I gained cooperation and support from many people who are themselves concerned with Thai fisheries, especially the following staff of SEAFDEC/TD:

Mr. Prasert Masthawe, Head of Ship Division

Mr. Somyos Soodhom, Head of Training Division

Mr. Aussanee Munprasit, Head of Fishing Gear Technology
Section, Research Division

Mr. Bundit Chokesanguan, Acting Head of Fishing Technology
Section, Training Division

Mrs. Hiromi (Isobe) Chokesanguan, Secretary to the Deputy
Secretary-General/Deputy Training Department Chief
(DSG/DTDC).

Moreover, I was given guidance and encouragement by Mr. Kazuo Inoue, DSG/DTDC of SEAFDEC, for completion of this booklet.

I would like express my gratitude to all those involved in the preparation of this book.

Table 2. Total canned tuna supply by selected countries, 1981-1985
(thousand metric tons)

	1981	1982	1983	1984	1985 ^{a/}
UNITED STATES					
Production	287	246	268	275	250
Import	32	40	55	74	97
Export	-	-	-	-	-
Total supply	319	286	323	349	347
JAPAN					
Production	111	113	117	124	114
Import	1	2	2	1	1
Export	35	36	37	46	35
Total supply	77	79	89	79	80
ITALY					
Production	49	48	52	59	60
Import	2	3	3	4	6
Export	2	2	2	2	2
Total supply	49	48	53	61	64
FRANCE					
Production	23	30	35	38	38
Import	28	30	34	33	38
Export	1	1	2	5	5
Total supply	50	59	67	66	71
SPAIN					
Production	40	37	32	30	28
Import	-	-	-	-	-
Export	12	2	4	4	4
Total supply	28	35	28	26	24
MEXICO					
Production	20	13	11	22	27
Import	1	-	-	-	-
Export	-	1	1	1	3
Total supply	21	13	11	21	24
UNITED KINGDOM					
Production	-	-	-	-	-
Import	19	13	18	24	23
Export	-	-	-	-	-
Total supply	19	13	18	24	23
GERMANY, FR					
Production	-	-	-	-	-
Import	14	15	16	19	20
Export	-	-	-	-	-
Total supply	14	15	16	19	20
THAILAND					
Production ^{b/}	(8)	(15)	(28)	(59)	(84)
Import	-	-	-	-	-
Export	(8)	(15)	(28)	(59)	(84)
Total supply	-	-	-	-	-
IVORY COAST					
Production	26	29	26	23	23
Import	-	-	-	-	-
Export	17	19	24	23	23
Total supply	9	10	2	-	-
PHILIPPINES					
Production	18	19	24	23	22
Import	-	-	-	-	-
Export	18	19	24	23	22
Total supply	-	-	-	-	-
TAIWAN					
Production	(14)	(11)	(15)	(13)	(12)
Import	-	-	-	-	-
Export	14	11	15	13	12
Total supply	-	-	-	-	-

Source : GLOBEFISH

a/ Preliminary data.

b/ Based on canned tuna import statistics in the United States, United Kingdom, Germany, and an additional 15 per cent allocation for exports to smaller markets, and assuming that 100 per cent of production is exported.

- Indicates less than 500 metric tons.

() Indicates estimate from best available data. Totals may not add due to rounding.

II. INTRODUCTION

While the tuna industry in Japan reminds us of tuna sashimi, in Thailand canned tuna is representative of the tuna industry. Its production in Thailand has rapidly been increasing from 500,000-600,000 cases (1 case : 7 oz standard (size) canned tuna x 48 pcs.) in 1979 to 4,000,000 cases in 1983, more than 8,000,000 cases in 1984 and 10,000,000 cases in 1985. In 1986, production of 12,000,000 cases is expected.

Roughly speaking, the background to the development of the Thai tuna industry differs from that of other countries such as Japan and the USA. In general, a tuna fishery is fostered in countries where they are blessed with a good tuna fishing ground. They make plenty of effort to catch large quantities of tuna for their own consumption using their own fishing boats.

Although production and consumption of tuna in Thailand were balanced around the time of the introduction of the canning industry, since the balance was not maintained due to the rapid growth of the Thai canning industry the industry was forced to import raw materials for canning.

The history of the tuna industry in Thailand started on a small-scale, and it has rapidly developed. At present, 12 per cent of the world's canned tuna is produced by Thailand. The share of canned tuna from Thailand has amounted to more than 60 per cent of the total canned tuna imported by the USA in the past 10 years.

Partially, this owes much to the establishment of SAFCOL, Thai-Australia joint venture, which has played the role of a pioneer in the Thai tuna canning industry. After SAFCOL, THAI UNION, another leading company, was established in 1973, and more and more packers who produce not only canned tuna but also other canned marine products, canned vegetables and fruits, set up business. After that UNICORD, which was established in 1978, has attained a leading position in this industry, and another two companies were founded in 1979, another two in 1980 and another one in 1981. To date a total of 30 tuna canning companies including ones who produce other types of canned products have been established in Thailand.

Why has the tuna canning industry in Thailand developed so fast during such a short period? The top producing and exporting country for canned tuna in the world was always Japan until 1983. Both the Ivory Coast and Senegal have produced and exported canned tuna for many years, and ranked second and third respectively until 1980.

However, as both countries are mainly aiming to export their products to France their canning business is not included in this booklet.

Fig. 1 Shows the main countries to export canned tuna to the US.

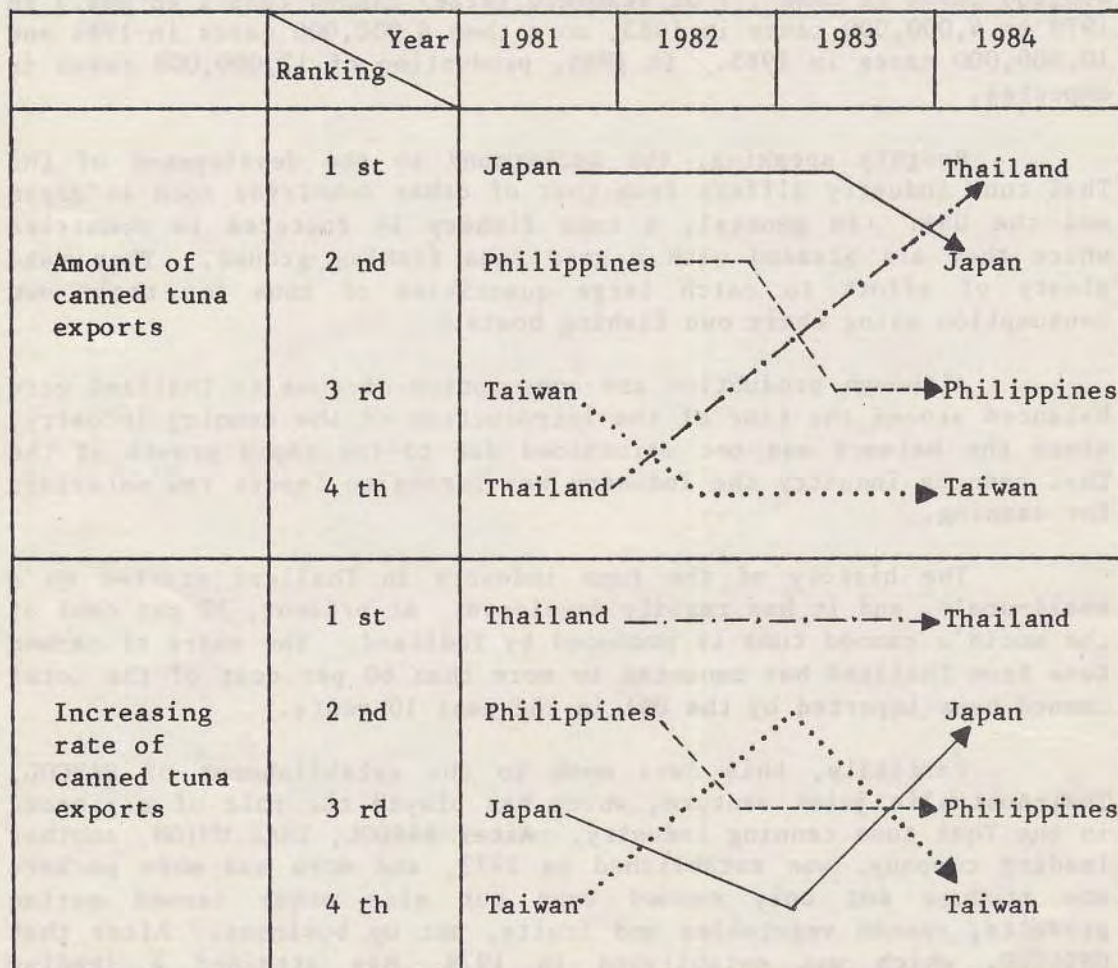


Fig. 1. Change of ranking in amount and increasing rate of canned tuna exports to U.S.A.

Source : Ministry of Commerce, U.S.A.

Catch is processed to preserve it for a long time and increase added value for more profit. For the canning industry, a large investment in plant and equipment is required for the various processing methods. Once operation starts, it is necessary to have a fixed quantity of raw materials which can be processed regularly. It is desirable to get the supply from a nearby fishing ground (the distance between places of supply and demand) whether it is domestic or imported. In this point, Thailand is located relatively near some tuna fishing grounds such as the waters of Indonesia and the Phillipines, the Indian Ocean and the South Pacific Ocean.

When the tuna canning industry was first introduced to Thailand, plants and equipment were invested in accordance with the quantity of raw materials supplied (catch quantity). With the development of the industry, catch effort was increased year by year. But catch did not necessarily increase in proportion to catch effort. Therefore, the industry came to a standstill at one time.

Since export from tuna canneries in Taiwan was in a decline because of a rise in local labour costs there, they established tuna canning factories in Thailand where tuna materials were easily supplied, and Thai women who are diligent and skillful were employed at a low labour cost. These are the above-mentioned THAI UNION established in 1973 and UNICORD established in 1978.

In the early stages of the industry it was never expected that the industry would develop so much that they would have to import raw materials. Its growth was to be more remarkable than they had expected. It was accelerated due to the following conditions: (1) Low production costs (2) Positive introduction of production technology (from Taiwan, Japan, Australia, Italy, USA and other countries) (3) A demand for raw materials, which increased suddenly, was supplied without major problems owing to global over-production of tuna (4) It was relatively easy to get raw materials but also to find a ready market using the help of various trading companies. (5) Since they mainly produce boiled canned tuna, custom duty was not imposed on the products in the USA, their main market. From the geographical aspect, Thailand is not necessarily located favorably to develop a tuna canning industry. Good tuna fishing grounds are not found in the waters surrounding Thailand. Migratory fish such as tuna do not appear particularly in the Gulf of Thailand whose depth is less than 100 m except small-sized tuna such as longtail tuna, Eastern little tuna (bonito), marlin (black marlin, Pacific sailfish, etc.) and small numbers of skipjack.

Another tuna family other than bluefin tuna and albacore inhabit the Andaman Sea on the Indian Ocean side. But their catch is not so large or seasonal.

In general, people in Southeast Asia do not enjoy eating red meat fish. In Thailand the average family in the city (large consumption area) does not eat it, although some of them have started to in recent years. Fresh longtail tuna is sold exceptionally to Japanese restaurants for sashimi or sushi some Thai seafood restaurants and supermarkets also stock it. The consumption of the fresh longtailed tuna can be estimated at about 1,000 tons at most (Note-1).

Markets selling sushi and sashimi of domestic tuna are more or less limited to Bangkok. The majority of their customers are Japanese staying in Thailand although some Thais are now enjoying it. The number of Thai and Japanese customers seems to be about equal. Of domestic tuna, under-sized ones or unfresh ones, which are not suitable as raw materials of canned goods or for sushi and sashimi, supply a demand for protein for people in the low income bracket living in the city, and in rural district and coastal communities. This kind of tuna accounts for 15 per cent of the total domestic tuna. It is not because of their preference for it but because of its low price.

Note-1:

The fish distribution system here is very complicated and it is difficult to obtain reliable estimates on both landings and consumption. Nevertheless the author estimated the amount of domestic consumption of tuna in the form of SASHIMI and SUSHI at around 2 per cent based on the per capita tuna consumption in the Bangkok area.

According to the fisheries statistical records provided by the Department of Fisheries in Thailand (DOF), Tunas are divided into Bonito and Tuna. Bonito includes the eastern little tuna and many varieties of bonito, while longtail tuna and other tuna species are included under Tuna.

The ratio of tuna to the total quantity of marine products is roughly estimated at 3 per cent (See Table 1). This is half of that of Japan (5-6 per cent, 500,000-600,000 tons of the total 10 million ton catch). Based on the table below, when comparing the annual production of tuna with Japan, whose production is about half skipjack the tuna production of Thailand is about one tenth.

Japanese people prefer to eat tuna in its fresh form, as SASHIMI but in Thailand the majority of the tuna is utilized for canning.

Table 3. Changes in catch of marine products and tuna, 1981-1984.

Item \ Year	1981	1982	1983	1984
(1) Total catch of tunas, (Ton)	23,000	53,000	86,000	76,000
(2) Amount of longtail tuna in (1), (Ton)	12,000	28,000	54,000	44,000
(3) Amount of Eastern little tuna in (1), (Ton)	11,000	25,000	32,000	32,000
(4) Price of longtail tuna (Baht per kg)	13.9	11.8	12.0	11.3
(5) Price of Eastern little tuna (Baht per kg)	18.4	9.7	8.8	9.3
(6) Amount of total marine production (Ton)	1,824,000	1,987,000	2,100,000	1,973,000
(7) Per cent of (1) / (6) (%)	1.3	2.7	4.1	3.9

Note: One Baht = appx. 10 Yen, October 1984

Source : Department of Fisheries, Thailand.

I.e., in Thailand though the quantity of the tuna catch is not as large as that of Japan, most of it is utilized as materials for canning.

The success of the tuna canning industry led to the increase of catch effort for tuna. Records show that the catch quantity peaked with 86,000 tons in 1983. This was four times as much as that of 1981 (23,000 tons). However, despite an increase in catch effort, the Thai inshore tuna fishery was not able to meet the demand of the tuna canning industry.

Therefore packers had to import tuna (especially skipjack). Currently big packers tend to rely more on imported frozen skipjack than domestic. In comparison with the latter, the size and quality of the former is standardized, though it costs more; its yield recovery is better; and it is bought in a businesslike manner. On the other hand, the domestic tuna is of an uneven size and quality, besides which catch quantity varies from season to season and is thus less suitable for regular large-scale mass production in big factories.

The Bangkok Post dated 16 January, 1985, said that since Thai tuna canners had imported more than 100 thousand tons of tuna as materials from neighbouring countries in 1984, Thailand was planning to establish a purse seine fishery of its own to raise the rate of self sufficiency (See Annex 28).

As a result of this piece of news, the Suppachoke Fishery Company intends to carry out a fishing activity in line with the above plan for the Thai tuna canning industry. This company has fished in the Gulf of Thailand since it was founded ten years ago, particularly trawl and purse seine.

The company also started to operate trawl fishing in the waters of Bangladesh and Indonesia under joint-ventures with those countries. The outline of this project is that fishing operations will be carried out in the waters of Indonesia by 30 Thai-style wooden purse seiners under the joint-venture programme with Indonesia (Boats of 100 tons with a 35 member Thai crew on board, up to boats of 150 tons with a 45 member Thai crew on board).

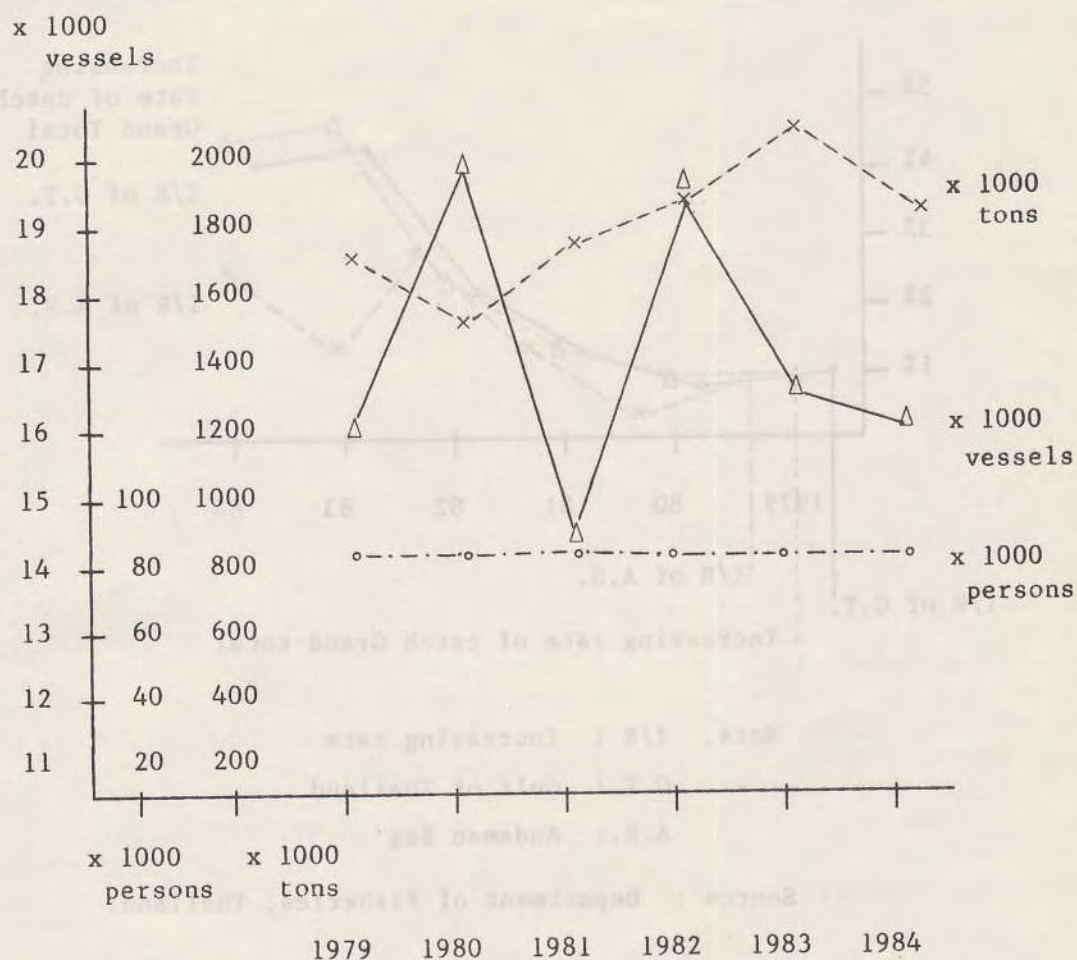
During the north-east monsoon (from November to March), they can operate in the fishing ground located in the waters around the Thai-Indonesia EEZ (200-mile Exclusive Economic Zone) between the west coast of Phuket island and the north coast of Sumatra island (See "E" area of Fig. 2), and during the south-west monsoon (from March to November) they can operate in the waters around the Indonesia EEZ including the west coast of Kalimantan (Borneo) island (See "D" area of Fig. 2). In the future, they plan to expand the fishing grounds where they operate in all the waters of the Indonesian EEZ.

Indonesia will receive profit sharing according to catch quantity in exchange for giving Thai fishermen the right and a licence to fish in its EEZ. Their business will be profitable, as long as the price of the catch is less than 15 baht/kg (93 yen/kg, exchange rate as of 1 December, 1986), while the International CIF (Cost, Insurance and Freight) price of skipjack is about 100 yen/kg. Therefore, their success will depend on how they take advantage of the geographically favorable conditions and low personnel expenses in their country. If this pelagic purse seine fishery company succeeds in conducting the fishing activity in the waters of Indonesia on a full-scale, some of the raw materials currently needed will be supplied.

III. TRENDS OF MARINE FISHERIES IN THAILAND

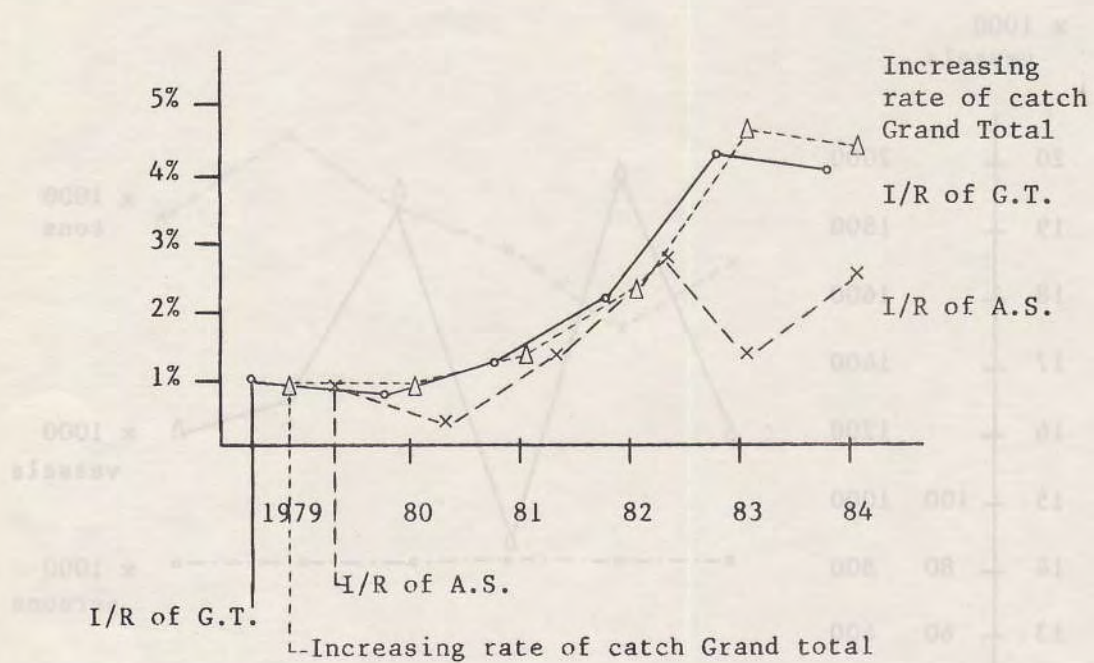
The modern marine fishery of Thailand started with the introduction of the trawl fishery with the help of the Government of West Germany. Until then the majority of fishing boats were unpowered boats of a small-scale and confined to coastal fishery. The introduction and development of trawl fishery also accelerated the introduction of powered fishing boats and the diffusion of purse seine and gill net fisheries which now comprise the main fishery of Thailand. As a result, in 1972, 10 years after the introduction of trawl fishery the annual catch for all the fishery was ten times as much as that at the beginning in 1960, i.e., about 150,000 tons/year. However, in 1982, another 10 years later, it reached 1,950,000 tons/year which was only 1.3 times as much as 1972. From 1982 to 1986, it has remained at approximately 2,000,000 tons/year (See Figs. 3, 4 and 5). The annual catch of tuna in Thailand has shown little increase over the last few years, and is at 80,000 tons/year. This is because of overfishing. According to the Department of Fisheries of Thailand, the MSY (Maximum Sustainable Yield) of tuna in waters belonging to Thailand is 80,000 tons/year i.e. 60,000 tons/year in the Gulf of Thailand and 20,000 tons/year in the Andaman Sea. The fishery statistics show that 35 per cent of the MSY in the Andaman Sea is utilized while in the Gulf of Thailand the actual catch exceeds by 20 per cent or 50 per cent the MSY level. This overfishing has affected the size of fish caught. Some fishermen engaged in tuna fishery say that the size of tuna schools and individuals have been getting smaller and smaller from year to year. According to packers of canned tuna here, most of the fish caught weighed about 3 kg ten years ago but now only about 1 kg.

In Thailand, the maximum annual consumption of tuna in 1986 was estimated at 270,000 tons, 190,000 tons of which was imported skipjack. The other 80,000 tons was domestic production. Of the above 270,000 tons, 240,000 tons is consumed as canned tuna. As previously stated, the domestic production of tuna consists of long-tail tuna and mackerel tuna. The ratio is 10 to 8 and their average size is rather small. (See Fig. 5)



Source : Department of Fisheries, Thailand.

Fig. 3. Change in No. of fishermen, total catch and No. of fishing vessels in Thailand.



Note. I/R : Increasing rate
G.T.: Gulf of Thailand
A.S.: Andaman Sea

Source : Department of Fisheries, Thailand.

Fig. 4. Increasing rate of tuna production and total marine catch in Thailand.

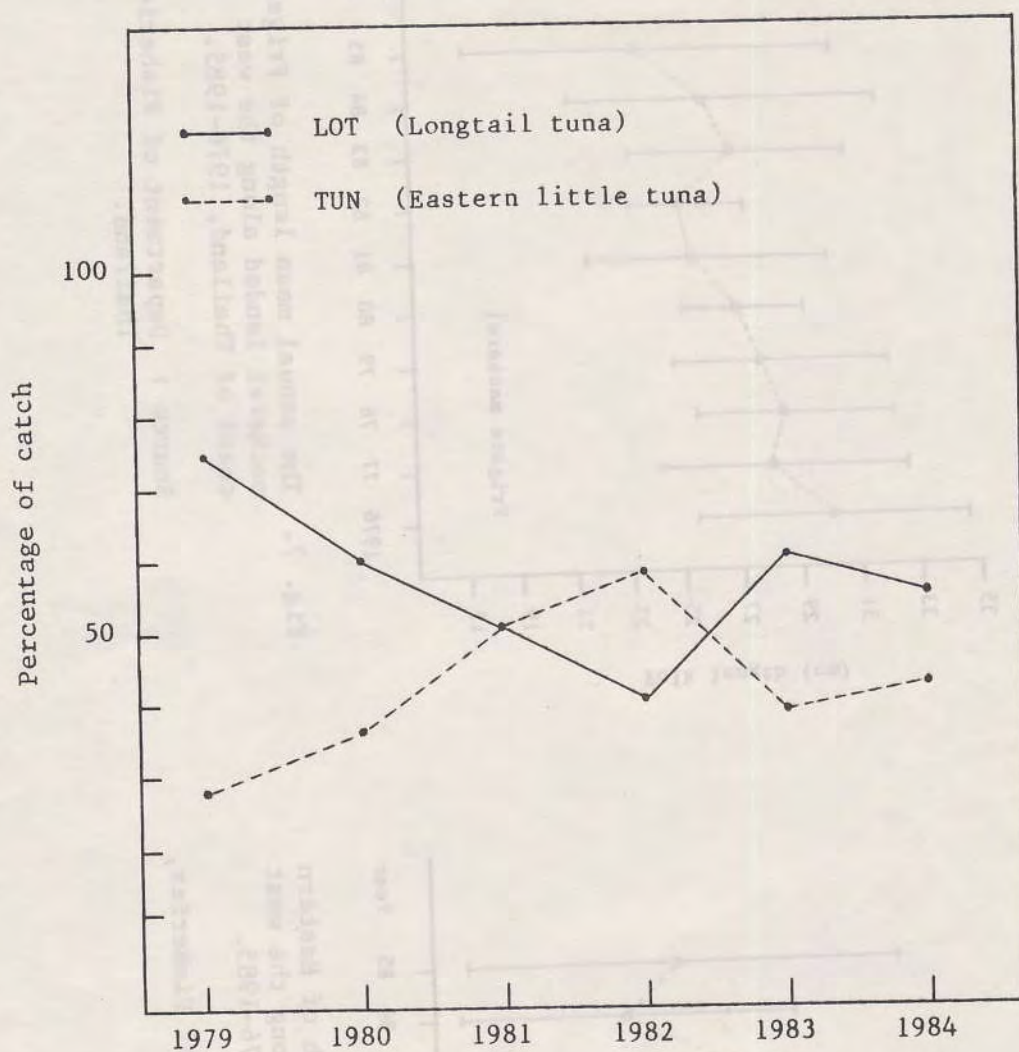


Fig. 5. Percentage contributions of Longtail tuna and Eastern little tuna to total tuna production, 1979-1984, in the Gulf of Thailand.

Source : Department of Fisheries, Thailand.

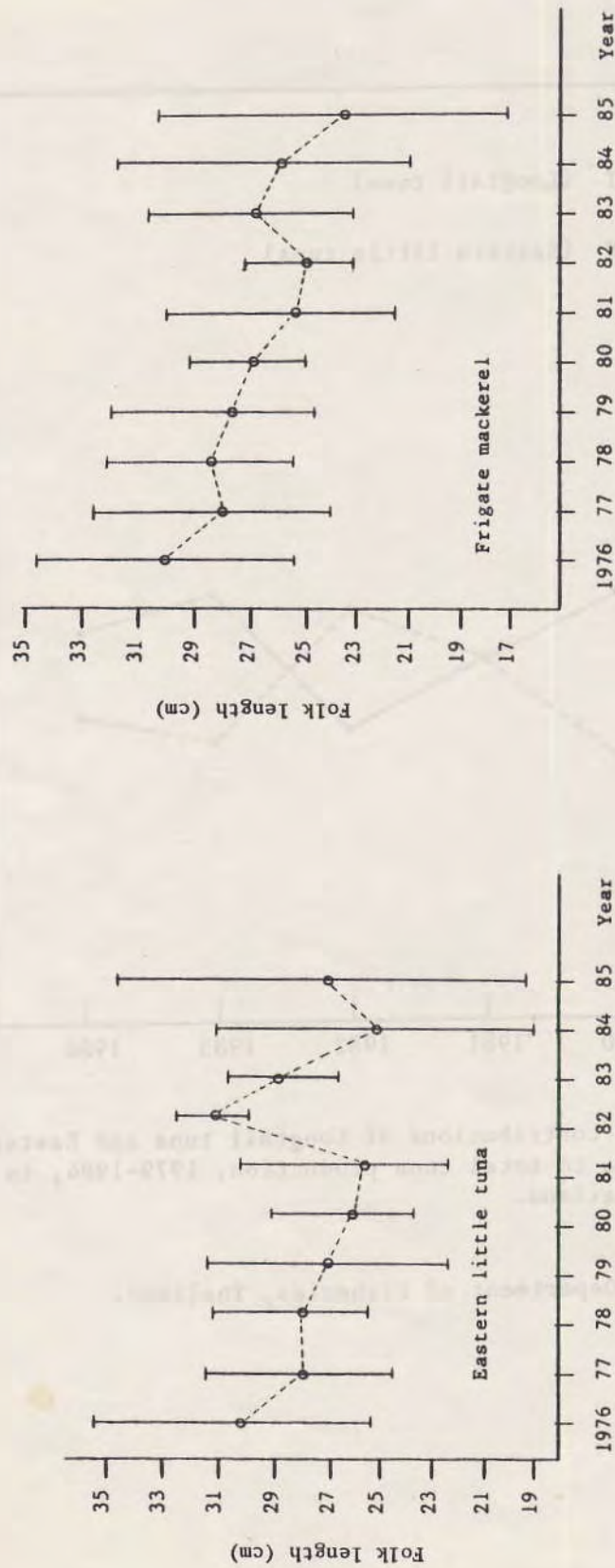


Fig. 6. The annual mean length of Eastern little tuna landed along the west coast of Thailand, 1976-1985.

Source : Department of Fisheries, Thailand.

Fig. 7. The annual mean length of Frigate mackerel landed along the west coast of Thailand, 1976-1985.

Source : Department of Fisheries, Thailand.

About 10 years ago tuna fishing grounds and seasons were well defined. Fishing operations started near the border between Thailand and Cambodia in the Gulf of Thailand in September, in the inner part of the Gulf in October and November, and in the south in December, and finished off Samui island in about February. Recently fishermen have expanded the fishing ground to where they can operate all the year round owing to the development of large-scale fishing boats and gears, equipment and technology. In the Andaman Sea on the side of the Indian Ocean fishing operations start near the border between Thailand and Malaysia (to the north of Penang island) in January, to the south (off Phuket island) in February and finish near the border between Thailand and Burma in March (see Fig. 2). In the Gulf of Thailand, Cambodia, Malaysia, Thailand and Viet Nam, disagree on the border of the EEZs and this continuously caused disputes among them. Moreover, in the Indian Ocean the EEZ of Thailand is bordered by that of Malaysia, Burma, Indonesia and India, and Thailand has long been blamed for causing trouble. It is a fact that Thailand is more developed in fishery and has a good lead over the other countries in the Southeast Asian region. As the countries of Indochina, which have long been involved in war, have made little progress in the establishment of states, (1) they are behind in the development of a fishery, and (2) fishery development is not part of their struggle. Therefore, the future of the fishery of these socialist countries, including Burma, is unpredictable. Although Indonesia and Malaysia, Islamic countries, are rich in natural resources, they are and will for a while, be behind in fishery when compared to Thailand. As to tuna resources around Thailand, some countries in this region cannot afford to prepare complete statistics and other countries have unreliable ones, due to the above-mentioned conditions. It is therefore, very hard to even estimate the quantity of tuna resources in the Andaman Sea or in the Gulf of Thailand.

For the total waters of Thailand the annual catch is 80,000 tons/year. As compared with the MSY in the fishing grounds where Thai fishing boats are allowed to operate legally, 100 per cent of the MSY is utilized. Strictly speaking, 120 per cent and 35 per cent of the MSY are utilized in the Gulf of Thailand and the Andaman Sea respectively. However, considering that the MSY of the Andaman Sea is smaller in its absolute quantity than that of the Gulf of Thailand, even if 100 per cent of the MSY of the Andaman Sea is utilized only 30 per cent of the demand for tuna material by the Thai canning industry will be supplied from Thai waters.

The problem here is that in the Gulf of Thailand 20 per cent or more above MSY is utilized due to excessive catch efforts. This means tuna resources in the Gulf of Thailand will be exhausted in the near future, which will influence the fate of the tuna fishery. The Thai tuna fishery will have to be expanded to pelagic fishery, not only to protect tuna resources but also for its own maintenance and development. This urged the advance of the Suppachoke Fishing Company into Indonesian waters.

IV. TUNA FISHERY IN THAILAND

1. Tuna of Thailand

Since the depth of the Gulf of Thailand is less than 100 m, migratory tunas such as yellowfin tuna, bigeye tuna, albacore and bluefin tuna do not appear there and neither do marlins such as striped marlin, swordfish and blue marlin. On the other hand, there are migratory bonito such as mackerel tuna, oriental bonito, frigate mackerel, bullet mackerel and skipjack but only in very small quantities. Only longtail tuna, black marlin and Pacific sailfish from the tuna and marlin families are found in numbers.

In the Thai waters of the Indian Ocean, less than 200 m in depth, there are no large-sized tuna species, only small-sized ones namely longtail tuna and yellowfin tuna. As to marlin; black marlin, Pacific sailfish and striped marlin, and with regard to bonito; mackerel tuna, oriental bonito, frigate mackerel, bullet mackerel and skipjack inhabit those waters.

Catch of tuna is mainly composed of longtail tuna and mackerel tuna in Thai waters. The catch of other tuna families is so small that it is not recorded in the statistical data of the Department of Fisheries of Thailand, with the exception of frigate mackerel which is classified into mackerel tuna. Table 4 shows the scientific names of the tuna of Thailand and the waters where each of them appears, accompanied with figures for each.

Table 4. Tuna found in Thai waters

	English name	Scientific name	Waters confirmed
Tunas	1. Longtail tuna	<i>Thunnus tonggel</i>	Gulf of Thailand, Andaman Sea
	2. Yellowfin tuna	<i>Thunnus albacares</i>	Andaman Sea
Bonitos	3. Eastern little tuna	<i>Euthynnus affinis</i>	Gulf of Thailand, Andaman Sea
	4. Frigate mackerel	<i>Auxis thazard</i>	Gulf of Thailand, Andaman Sea
	5. Bullet mackerel	<i>Auxis rochei</i>	Gulf of Thailand, Andaman Sea
	6. Striped bonito	<i>Sarda orientalis</i>	Gulf of Thailand, Andaman Sea
	7. Skipjack	<i>Katsuwonus pelamis</i>	Gulf of Thailand, Andaman Sea
Gillfishes	8. Black marlin	<i>Makaira indica</i>	Gulf of Thailand, Andaman Sea
	9. Pacific sailfish	<i>Istioparus platypterus</i>	Gulf of Thailand, Andaman Sea
	10. Striped marlin	<i>Tetrapturus audax</i>	Andaman Sea

Source : Department of Fisheries, Thailand.

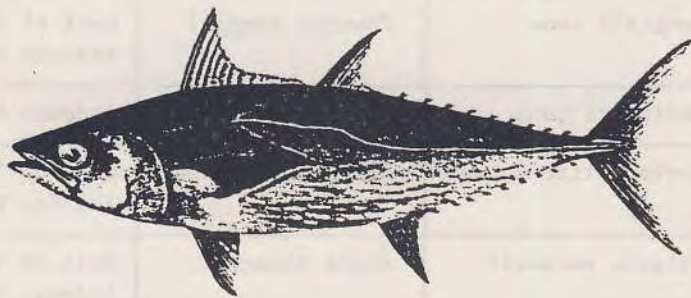


Accompanying documents:

10 Drawings of tuna and gillfish found in Thai waters

Source : Department of Fisheries, Thailand.

①



Thunnus tonggol

②



Thunnus albacora

③



Euthynnus affinis

④



⑤



④
⑤

Auxis thazard
Auxis rochei

⑥



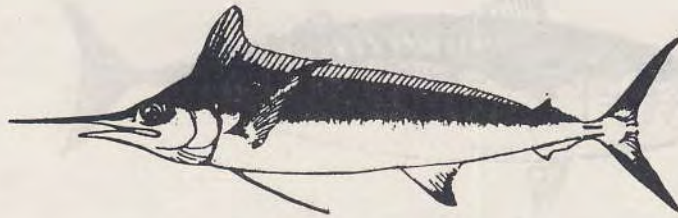
⑦



⑥
⑦

Katsuwonus pelamis
Sarda orientalis

⑧



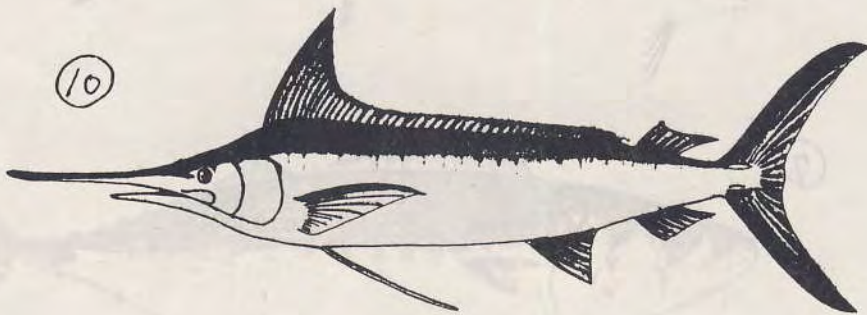
Makaira indica

⑨



Istioporus platypterus

⑩



Makaira mitsukurii

2. Fishing ground and season

Longtailed tuna and mackerel tuna are caught in almost the same fishing ground. The fishing season is not fixed. Some say it is simply when lots of tuna schools appear others that the north-east monsoon from November to March is the fishing season when fishing operations are carried out in the northern part of the Gulf of Thailand, and that the southwest monsoon is when the southern part of the Gulf of Thailand is the fishing ground for tuna. Thai waters in the Andaman Sea on the Indian Ocean side are fished during the north-west monsoon from December to March. Currently fishing operations for longtail tuna and mackerel tuna are conducted almost all year round. However, 10 years ago fishermen started fishing operations in the waters near the border between Thailand and Cambodia (on the Thai side) in September for tuna which migrates into the Gulf of Thailand passing through the waters off Viet Nam and Cambodia. Then they would go up to the north of the Gulf in November and down south to Samui island in February, and finish off Pattani in April or May.

With the growth of the Thai canning industry, fishing operations have been carried out all year round in the center of the Gulf of Thailand since the second half of 1970, "A" waters in Fig. 2, mainly for the purpose of supplying raw materials to the industry.

The increased catch encouraged the development of the Thai tuna canning industry which laid the foundations for the present prosperity of both industries in Thailand. With the increased demand of the Thai tuna canning industry, the catch in "A" waters could not be expected to meet it, so Thai fishing boats advanced into "B" and "C" waters.

The countries concerned namely Thailand, Malaysia, Cambodia and Viet Nam have not reached an agreement yet on EEZ demarcation lines inside "A" waters. In addition, since neither "B" nor "C" waters belongs to Thailand and are not the high seas, more and more trouble has been caused between Thai fishing boats and fishermen or the authorities of the other countries concerned.

According to a newspaper and a news program on the radio, fishermen who had been captured by Viet Nam are only released after the Thai Government has compensated for their error. This kind of trouble has occurred quite often recently.

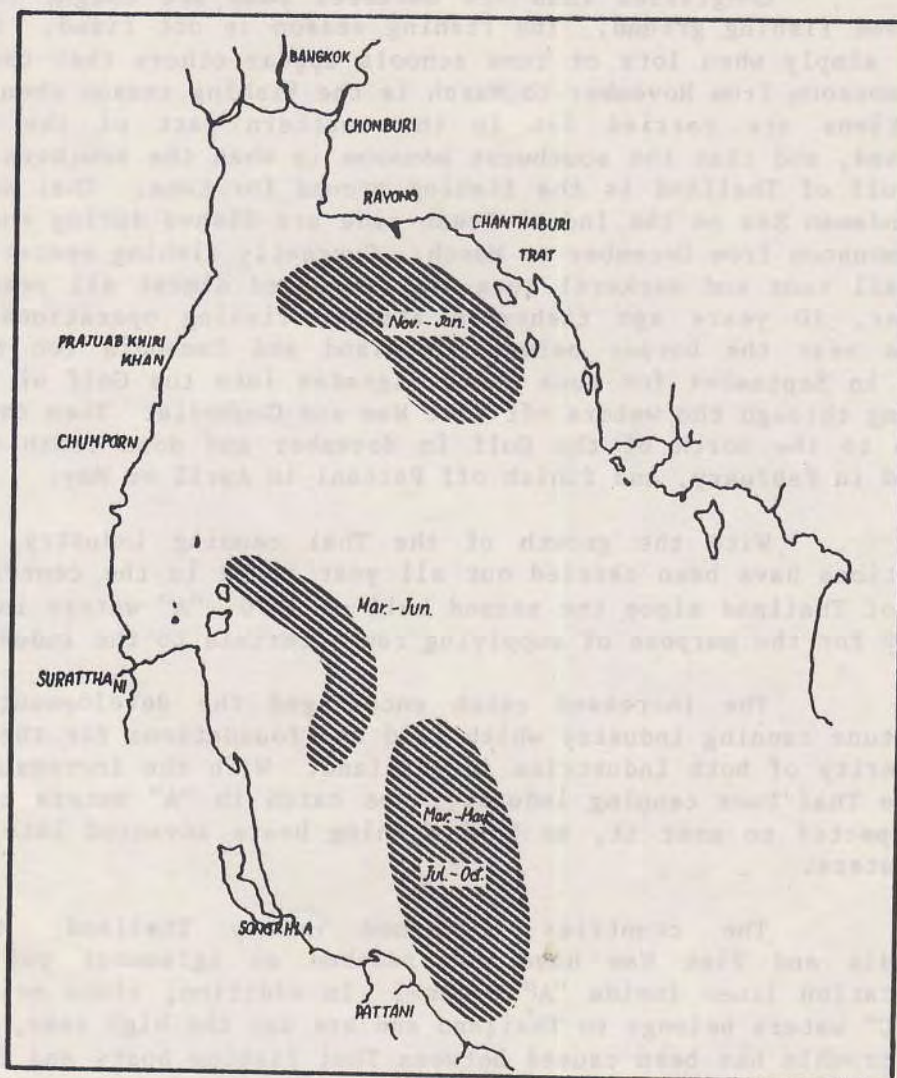


Fig. 8 Fishing seasons and fishing grounds of coastal tunas

Source : Department of Fisheries, Thailand.

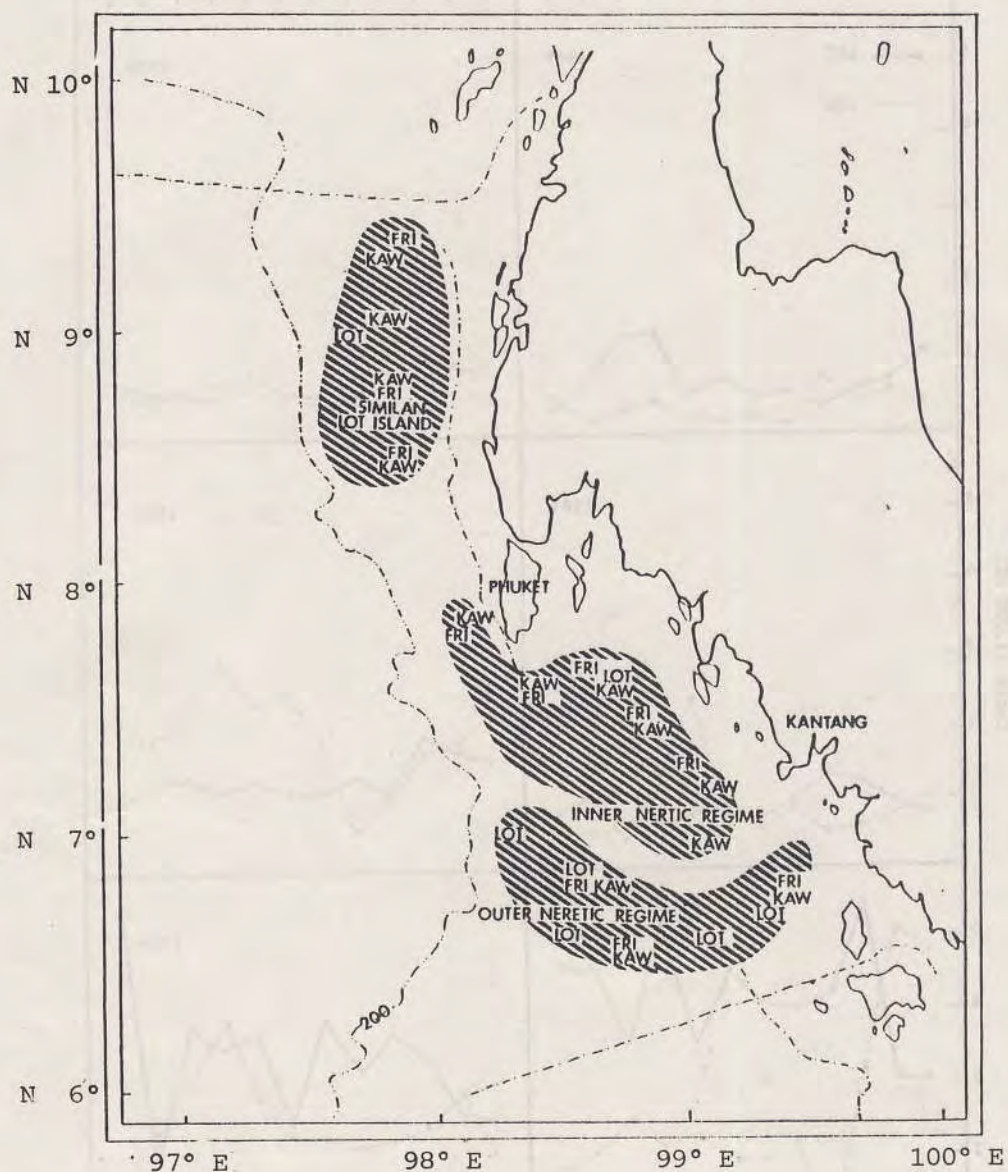


Fig. 9. Major fishing grounds for tunas along the west coast of Thailand.

Note: FRI = Frigate mackerel, KAW = Kawakawa, Eastern little tuna, LOT = Longtail tuna

Source: Department of Fisheries, Thailand.

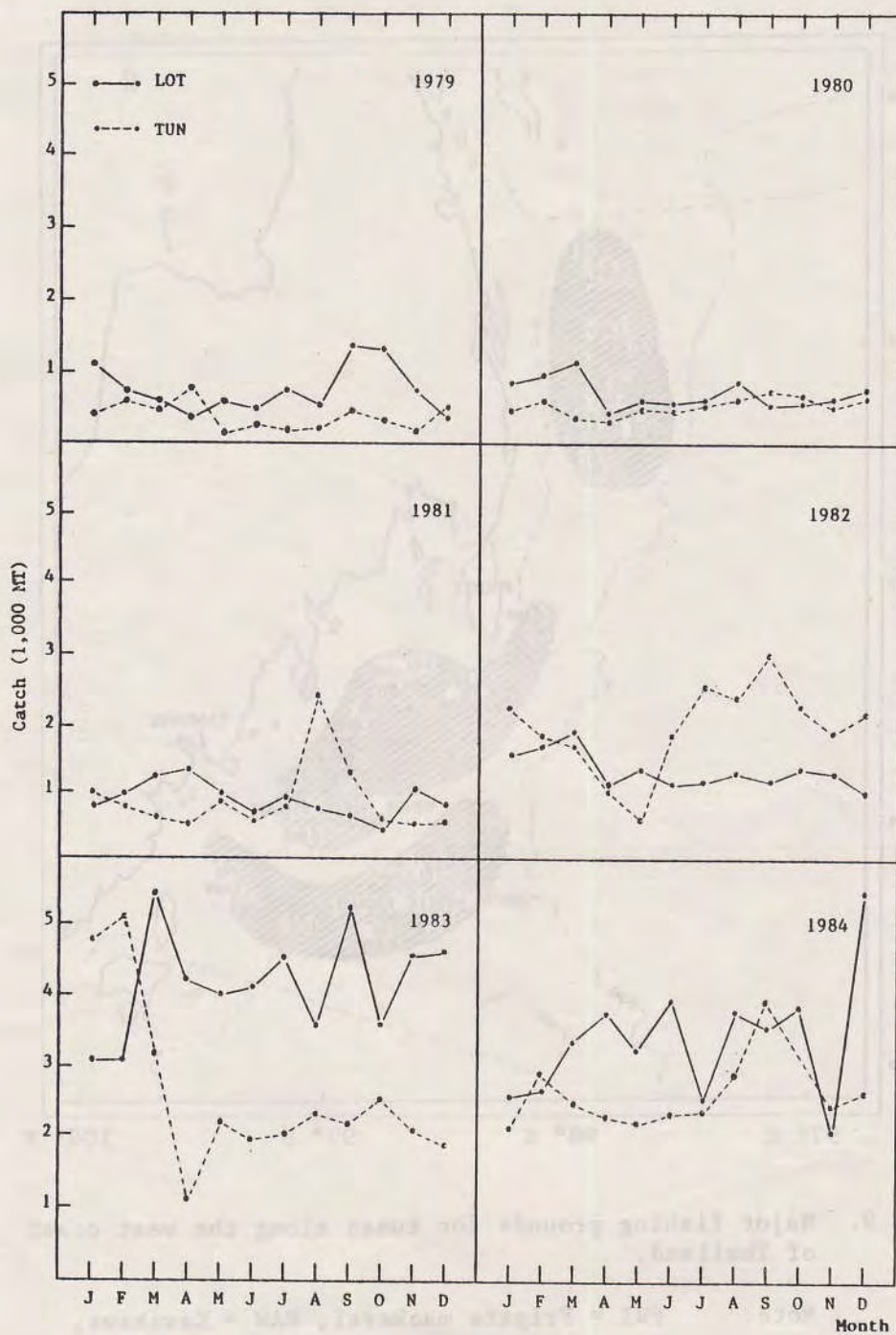


Fig. 10. Seasonal variations of Longtail tuna and Eastern little tuna by major types of fishing gear operated in the Gulf of Thailand, 1979-1984.

Source : Department of Fisheries, Thailand.

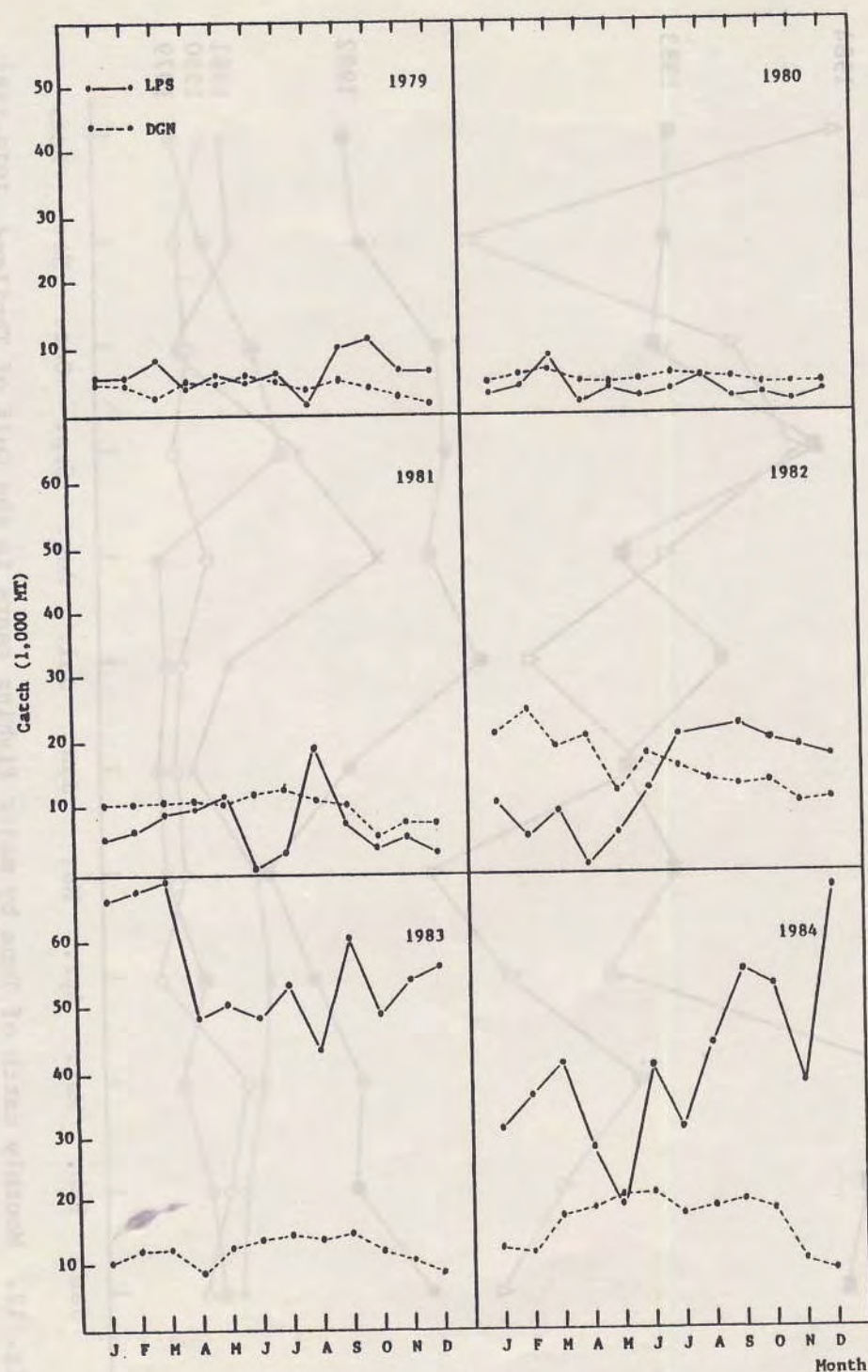


Fig. 11. Seasonal variations of catch of Tuna by type of gear in the Gulf of Thailand, 1979-1984.

Source : Department of Fisheries, Thailand.

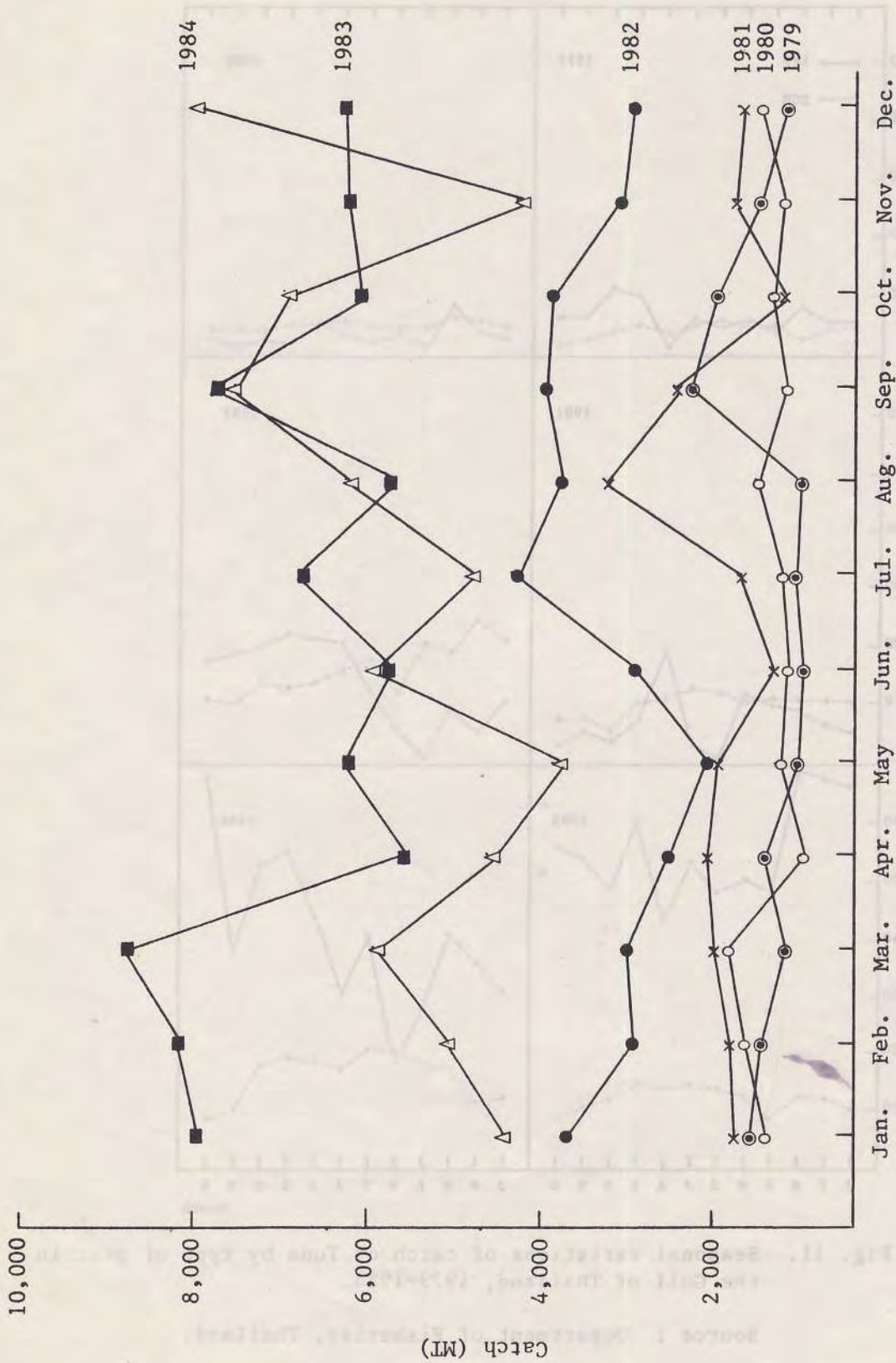


Fig. 12. Monthly catch of Tuna by major fishing gears in the Gulf of Thailand, 1979-1984.

Source : Department of Fisheries, Thailand.

3. Catch quantity

Since tuna was not suited to Thai taste up until the early stages of the Thai tuna canning industry the price was so cheap that tuna fishery did not pay. (See Figs. 13 and 14)

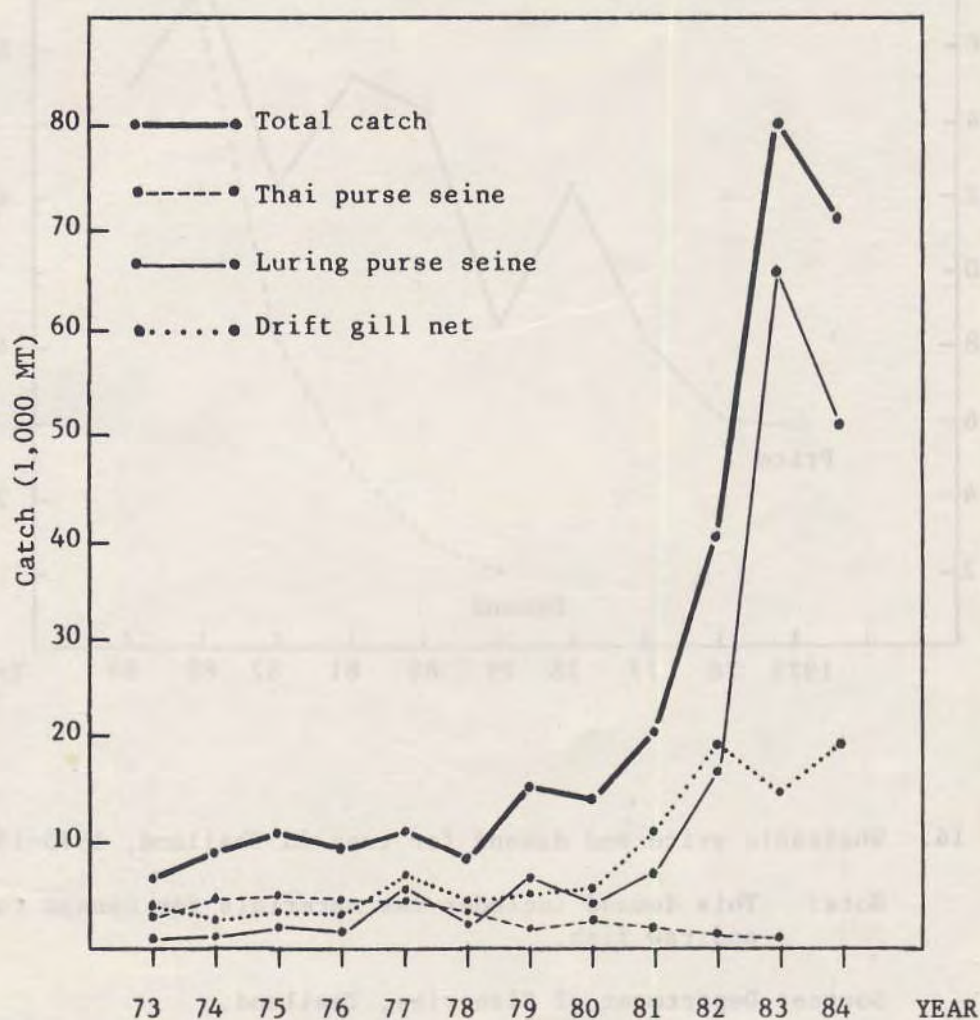


Fig. 13. Annual catch of tunas by major types of fishing gear in the Gulf of Thailand, 1973-1984.

Source : Department of Fisheries, Thailand.

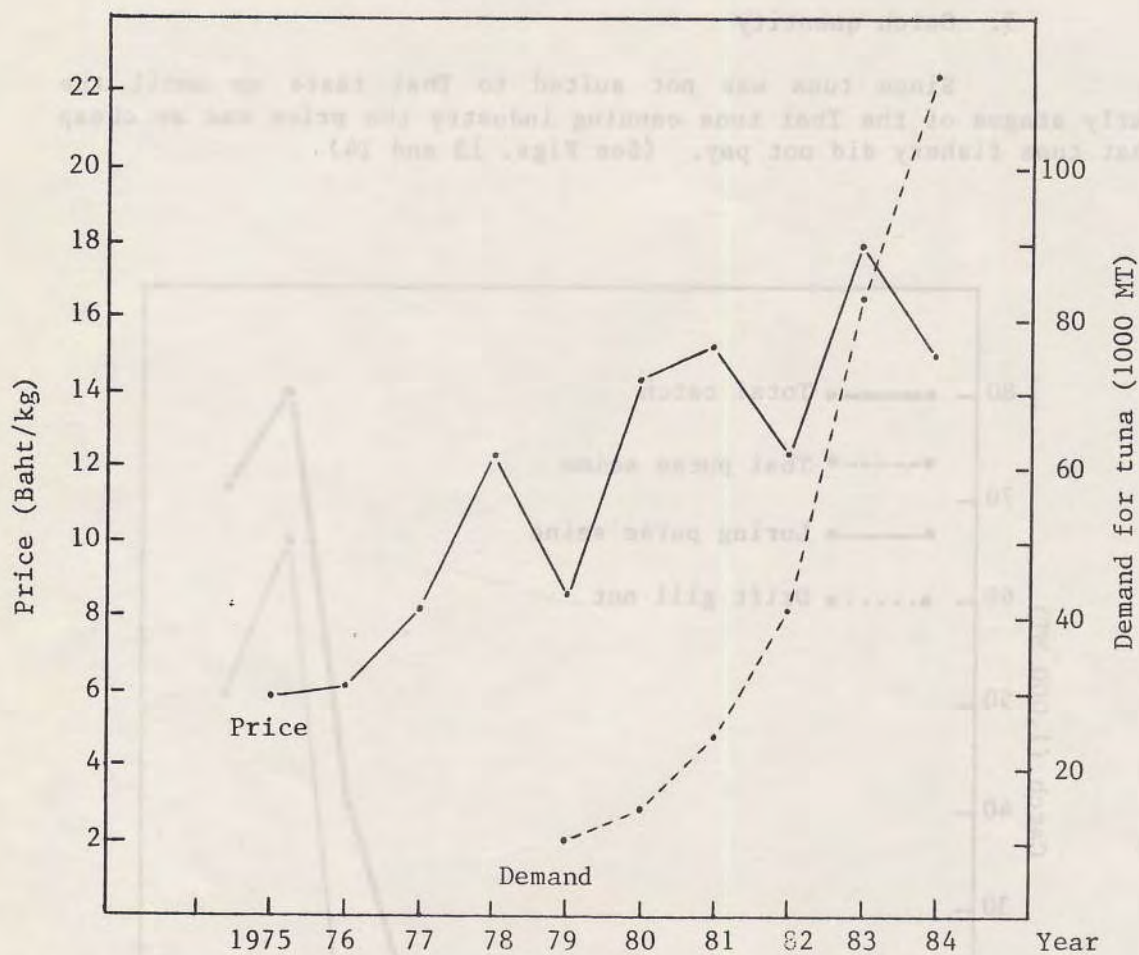


Fig. 14. Wholesale price and demand for tuna in Thailand, 1975-1984.

Note: This demand includes raw materials for canned tuna and raw fish.

Source: Department of Fisheries, Thailand.

As shown in Fig. 13, catch quantity of tuna in Thailand was 7,000 tons in 1973, 20,000 tons in 1981 and 80,000 tons in 1983. It is reported that after the remarkable rate of increase of catch quantity reached its peak in 1983 it showed little increase with 76,000 tons in 1984 and 80,000 tons in 1985 and 1986. This is because even small young fish were caught and immediate measures should have been taken against overfishing.

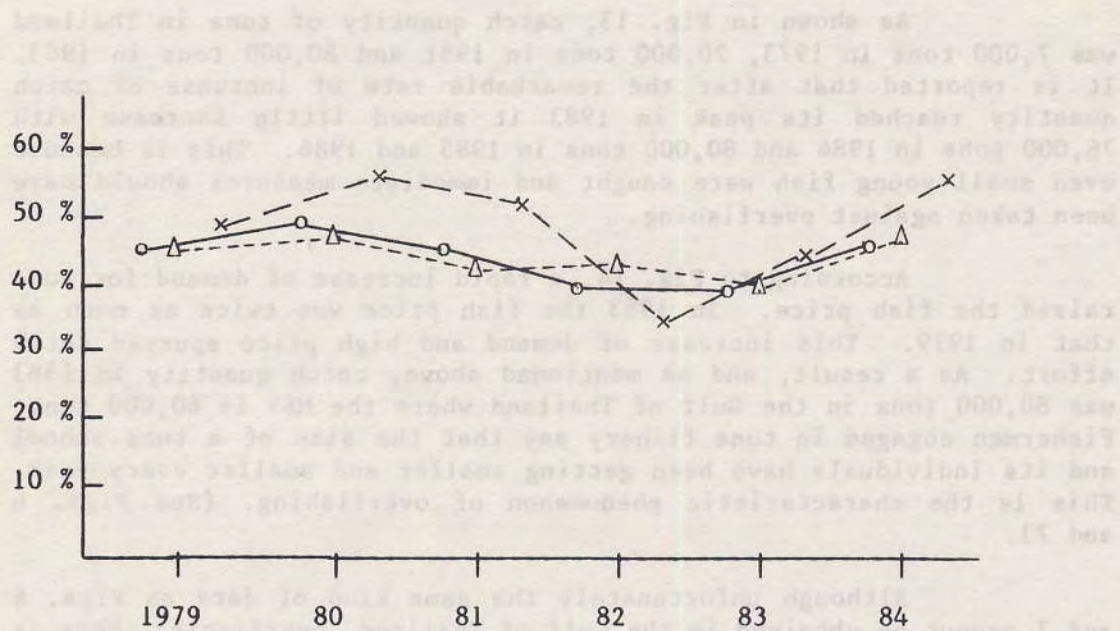
According to Fig. 14, a rapid increase of demand for tuna raised the fish price. In 1983 the fish price was twice as much as that in 1979. This increase of demand and high price spurred catch effort. As a result, and as mentioned above, catch quantity in 1983 was 80,000 tons in the Gulf of Thailand where the MSY is 60,000 tons. Fishermen engaged in tuna fishery say that the size of a tuna school and its individuals have been getting smaller and smaller every year. This is the characteristic phenomenon of overfishing. (See Figs. 6 and 7).

Although unfortunately the same kind of data as Figs. 6 and 7 cannot be obtained in the Gulf of Thailand, overfishing there is supposed to be more serious due to the more active fishing activity than in the Andaman Sea. Another cause of accelerating exhaustion of tuna resources is indiscriminate fishing. In trawl fishery, young fishes are also caught to supply raw materials for fish meal.

4. Fishing boats, gears and methods

The only fishing method for tuna is the Thai (style) purse seine. Luring purse seine for small-sized pelagic fish and drift net for spanish mackerel are also used to catch tuna. Although most of the total catch of tuna is derived from Thai purse seine, catch from luring purse seine is much more than that from Thai purse seine according to the data of the Department of Fisheries of Thailand. The popular size of trawler and purse seiner in Thailand varies from 10 tons to 150 tons, that is, small-scale, middle-scale and large-scale boats. Most boats are of the standard poop type with a big main deck to facilitate fishing operations (See Accompanying documents).

Purse seiners and drift netters have fish holds and storage for fishing gear under the main deck and the deck is utilized as a place for nets. Thai purse seines are made of wood and their service life is about 10 to 15 years. Equipment on board develops year by year. Fig. 16 shows the number of Thai tuna fishing boats and all the Thai fishing boats from 1971 to 1984.



Source : Department of Fisheries, Thailand

Note : Δ ; Rate of total trash fish to total catch of marine fishery in Thai waters

○ ; Trash fish rate to total marine production of Thai waters in the Gulf of Thailand

× ; Trash fish rate to total marine production of Thai waters in the Andaman Sea.

Fig. 15. Catch rate of trash fish against total marine fishery catch

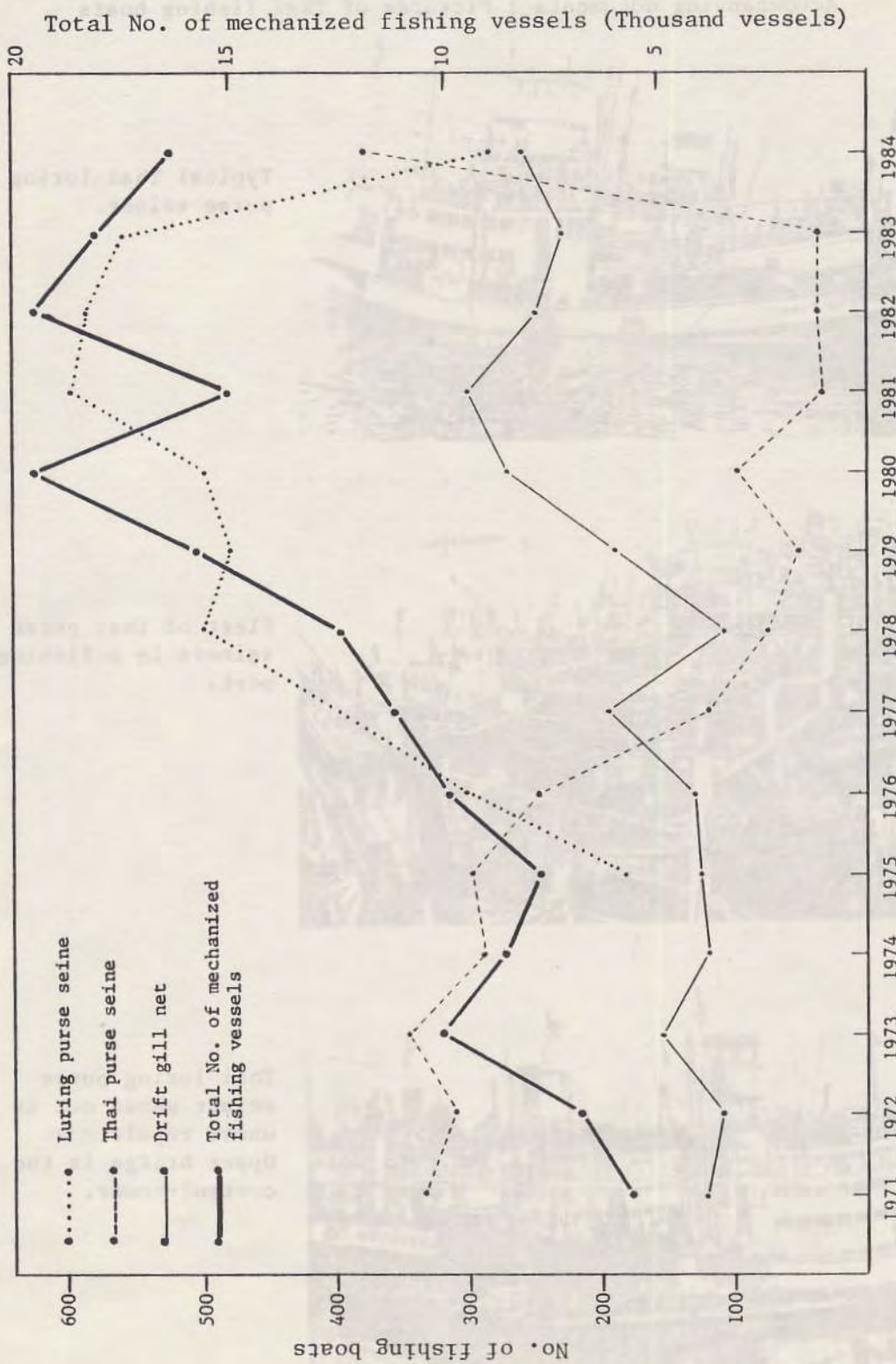


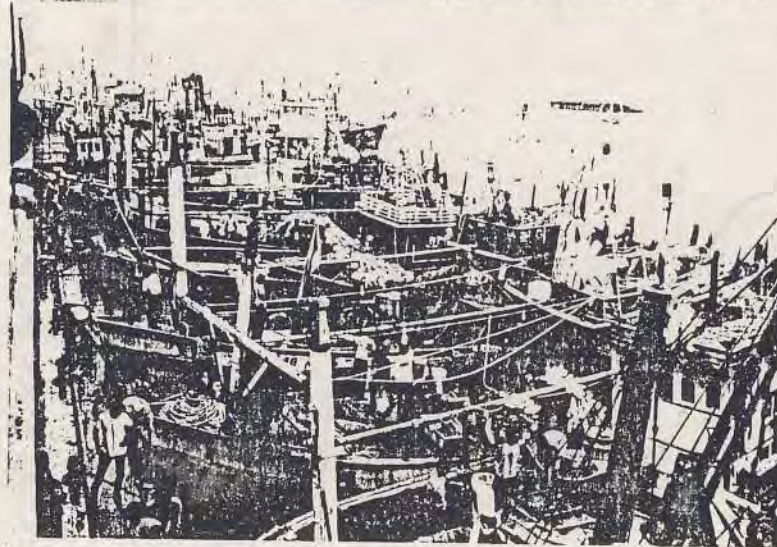
Fig. 16. Number of fishing boats registered in the Gulf of Thailand, 1971-1984.

Source : Department of Fisheries, Thailand.

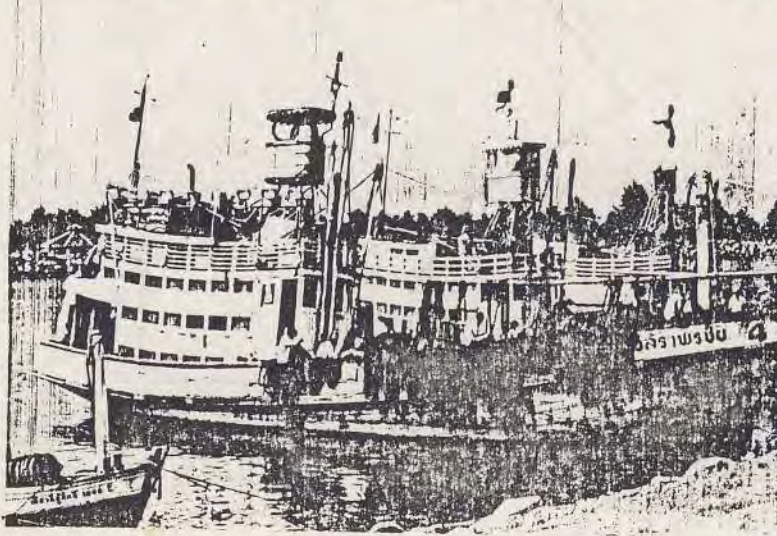
Accompanying documents : Pictures of Thai fishing boats



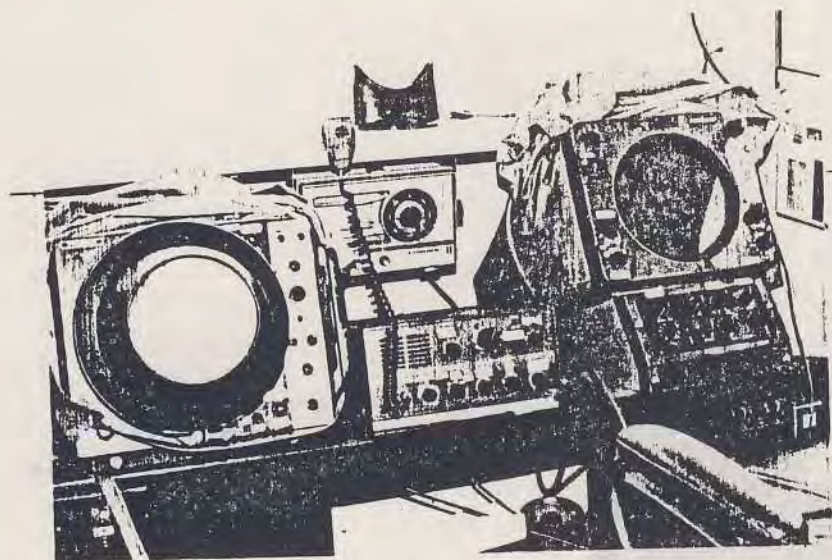
Typical Thai luring
purse seiner.



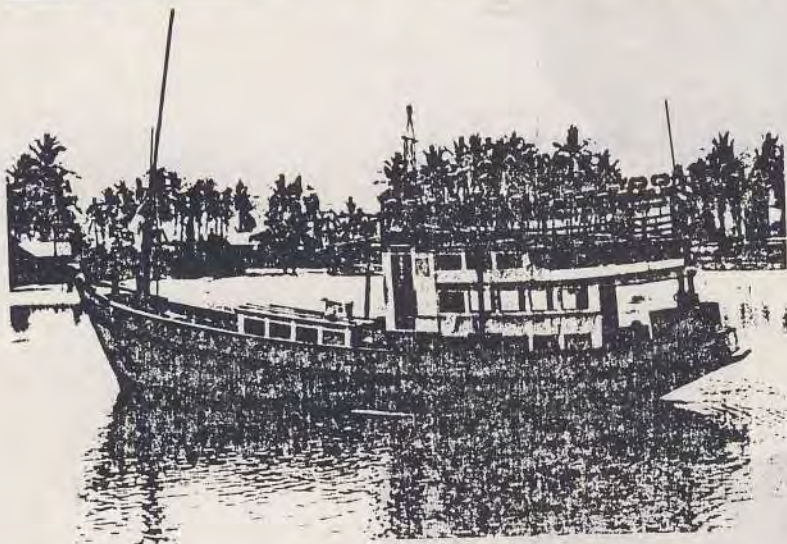
Fleet of Thai purse
seiners in a fishing
port.



Thai luring purse
seiner whose net is
under repair.
Upper bridge is the
control-tower.



Control tower of Thai bonito purse seine with equipment such as : fish-finder, sonar and radar.



Light boat of a luring purse seiner



Middle-size otter board trawler.



Middle-size drift gill netter for spanish mackerel, Eastern little tuna and longtail tuna.



Same as above. In comparison with purse seiners and trawlers, the machinery installed is limited.

As mentioned above, every type of boat is constructed along the same lines, and since the conversion of fishing gears is easy, some fishermen register their boat as a trawler at one time and at another time they do so as a purse seiner. This is the reason for the difficulty of statistically showing an accurate number of fishing boats.

The scale of the Thai purse seiner varies from 80 tons (24m) to 150 tons (32m) with 100 tons/28 m as the most popular size. About 35 crewmen can board a boat of 80 tons, and about 45 crewmen a boat of more than 100 tons.

In fishing operations by 100-ton Thai purse seiners, after a lookout sees a fish school with or without binoculars, the boat follows it until fishing operations start in the evening or the following morning. During this time the movement and condition of the school is examined through a fishfinder and sonar. Operations begin in the twilight when fish move very slowly in a dense school.

As the Gulf of Thailand is shallow, 60 to 70 m deep and the speed of the current is less than 1 knot, the method mentioned above is quite effective.

Figs. 17 and 18 show fishing operations by Thai purse seiner and luring purse seiner, respectively. In an operation by Thai purse seiner, the net is hauled at both broadsides without a tug boat, while the purse seiner is operated using the main engine skillfully to keep the net shape in the best condition, which is characteristic of this fishing method. The difference between Thai purse seine and luring purse seine is that in the former a fish school must be found and, in the latter fish are lured into a school under the fish attraction lamps and simple payao made of palm leaves.

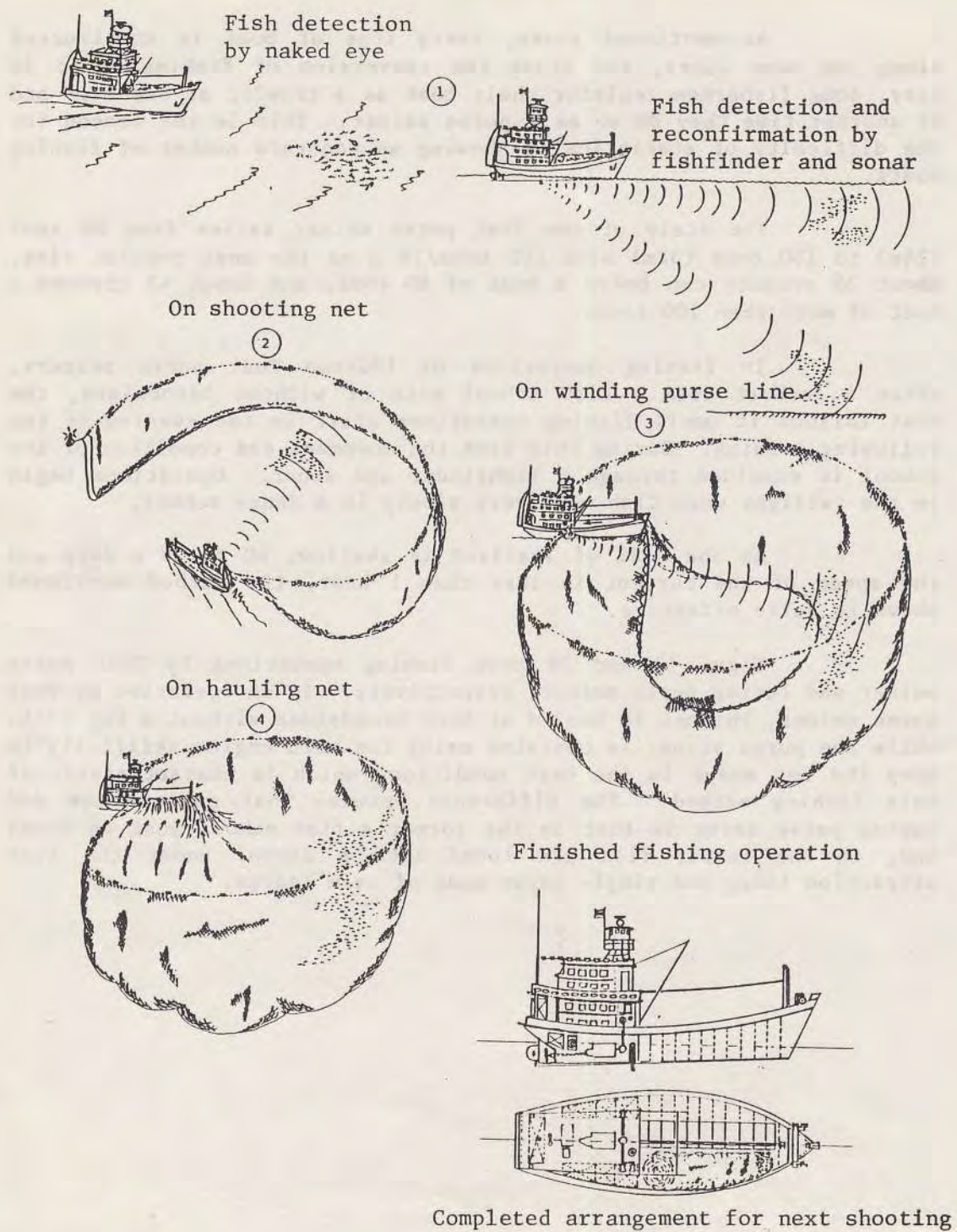
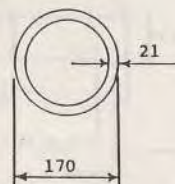
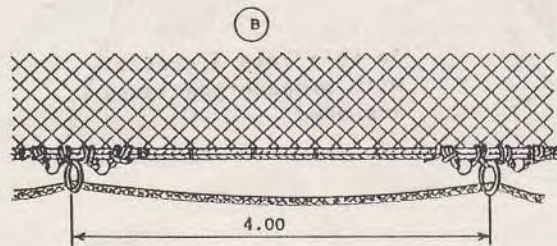
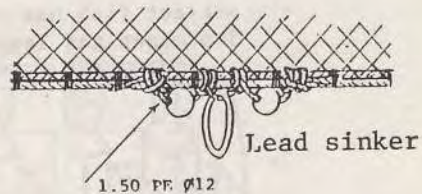
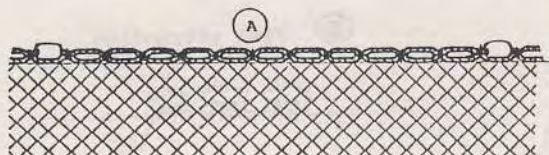


Fig. 17. Fishing operation of Thai bonito purse seiner
(Figs. 17-20. Source : Training Department, SEAFDEC)

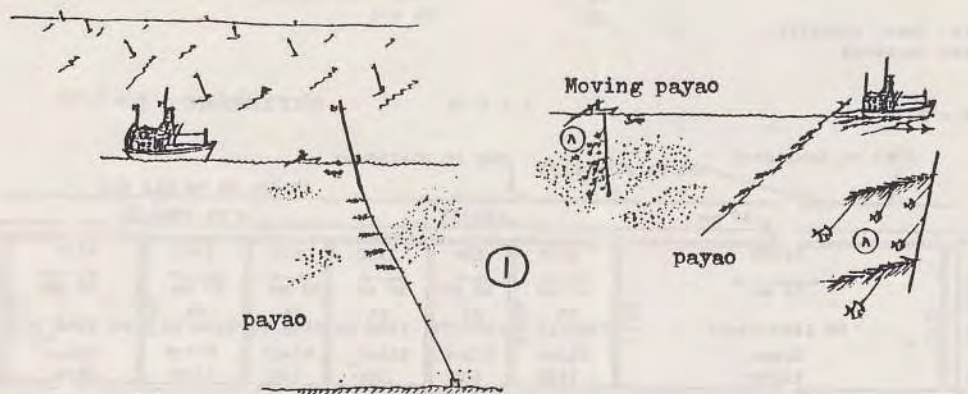
Loa	32 m
hp	400
EG	50 KVA

$$E = 0.70$$
$$E = 0.70$$
shrinkage, $E = 0.70$ 
$$E = 0.75$$
$$E = 0.75$$


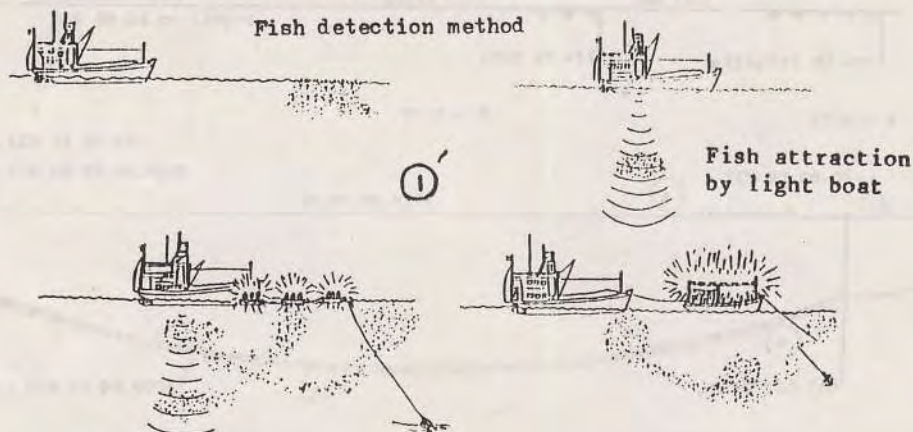
Size of purse ring

Fig. 18. Example of Thai bonito purse seine specification.
Net size range 80 m x 800 m to 120 m x 1600 m.
Mesh size of bag net is 25 mm to 50 mm.

① and ①' show the fish detection and luring method

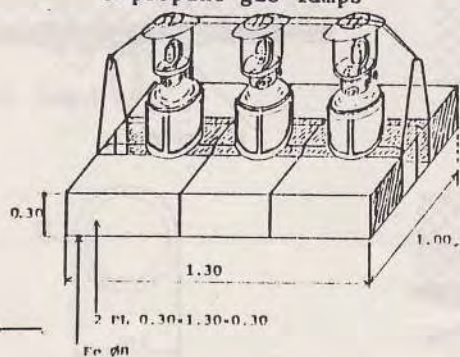


Fish detection method

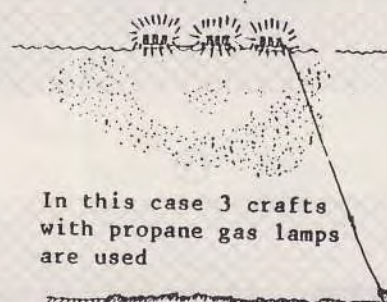


Fish attraction by light boat

Floating craft to attract fish has 3 propane gas lamps



⑤ Fish attraction

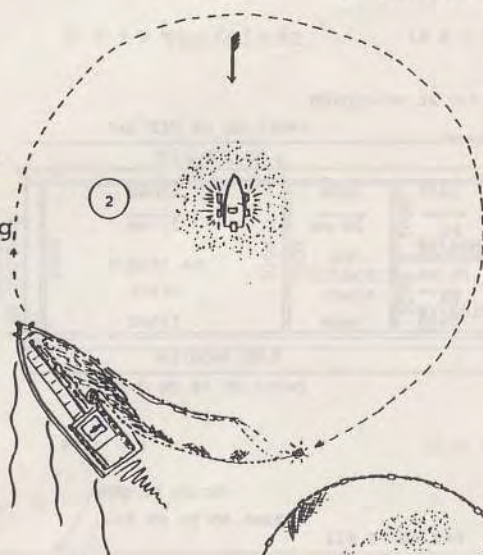


In this case 3 crafts with propane gas lamps are used

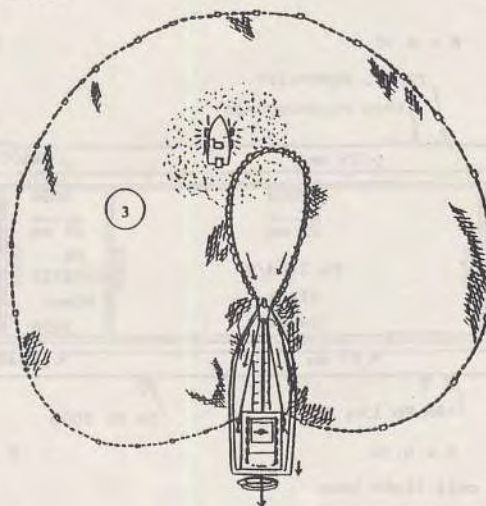
Fig. 19. Fishing operation by Thai luring purse seiner, and its fish detection and luring method.

Wind direction

Beginning
of shooting
net

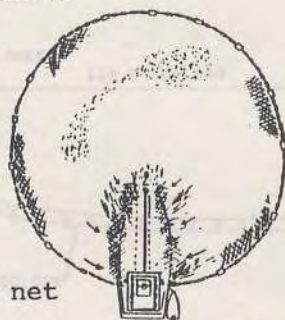


Winding in
purse line



Adjustment of shape of net by
using propeller and steering

4



On hauling net

5



On scooping catch

Note : In all purse seining carried out in Thai waters, except Chinese purse seining, the purse line is wound from both sides of the bow (see 3) and the net is hauled from both sides of the vessel, as above.

Kind of fishing gear;
Luring purse seine
Target fish;
Sardine, Mackerel, Scad,
Trevally

Size of vessel
length : 20 m
main eng : 240 ps

Net size is
100 m x 665 m

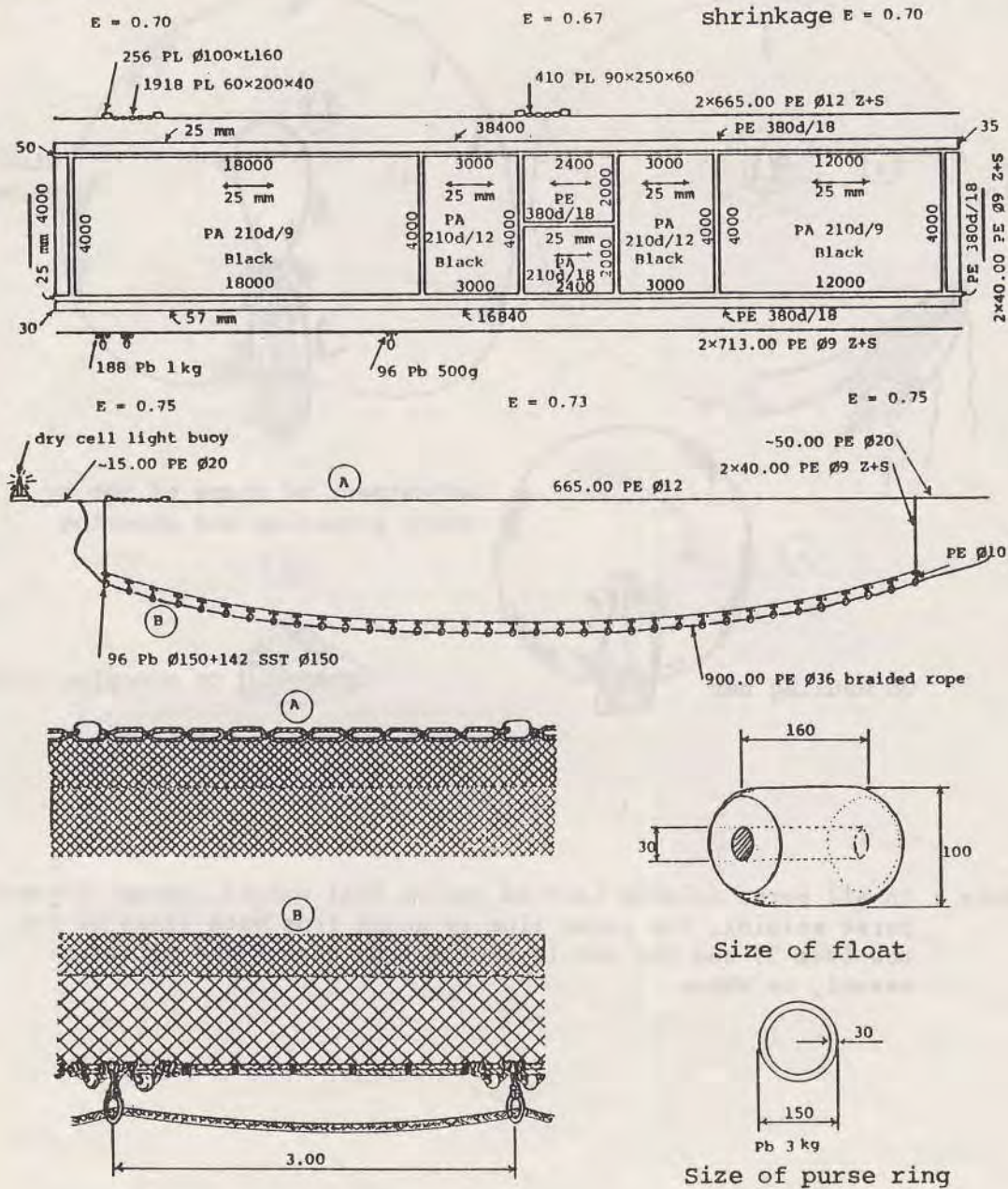


Fig. 20. Example of luring purse seine specification.

Since the net is hauled by human power, a number of hands are needed, although the purse line is hauled up by twin drums installed at both sides of the poop through the bow. Each fishing boat has on board a net of large mesh size for tuna and also one of small mesh size for small-sized pelagic fish. No spares are carried, therefore, a net which is damaged during an operation must be repaired by a professional repairman on land once the boat enters a port. It takes a Thai purse seiner 7 to 10 days from departing to re-entering a port, and in the case of a luring purse seiner, 1 to 3 days. Iced storage for catch is adopted, but freshness is not preserved well because the structure of the fishhold is not sufficiently isolated. This is especially true of Thai purse seiners, due to the long hours underway between fishing ground and port which reduces the freshness of the catch.

The tuna catch is not supplied for general consumption as a fresh fish without processing, but becomes a raw material for canned tuna. Therefore, no measures have been taken to preserve the freshness of the fish. The size of a drift netter for Spanish mackerel varies from 10 tons to 50 tons and a boat is operated by a crew of 10 to 15. During 1971 to 1984 the number of fishing boats tended to increase and during 1978 to 1981 it increased particularly fast. Catch also increased in proportion to the rapid increase of catch effort, and especially, the catch of longtail tuna and mackerel tuna shows a remarkable rate of increase (See Fig. 21 and Table 5). This exerted an effect on the price of Spanish mackerel. Its price (8฿/kg) was four times as much as that of longtail tuna (2฿/kg) in 1971, and in 1980 the former (24฿/kg) was 1.7 times as much as the latter (14฿/kg). This means longtail tuna had been highly valued, which led to an increase of catch effort in the drift net fishery.

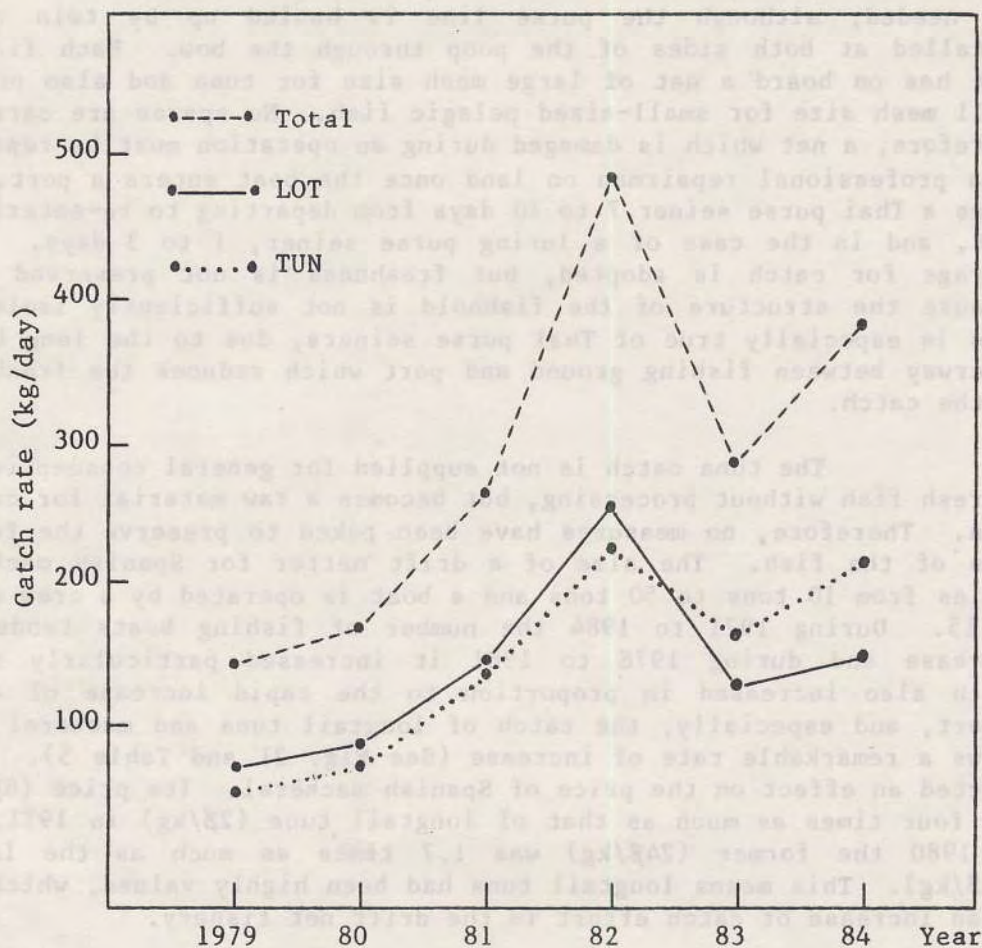


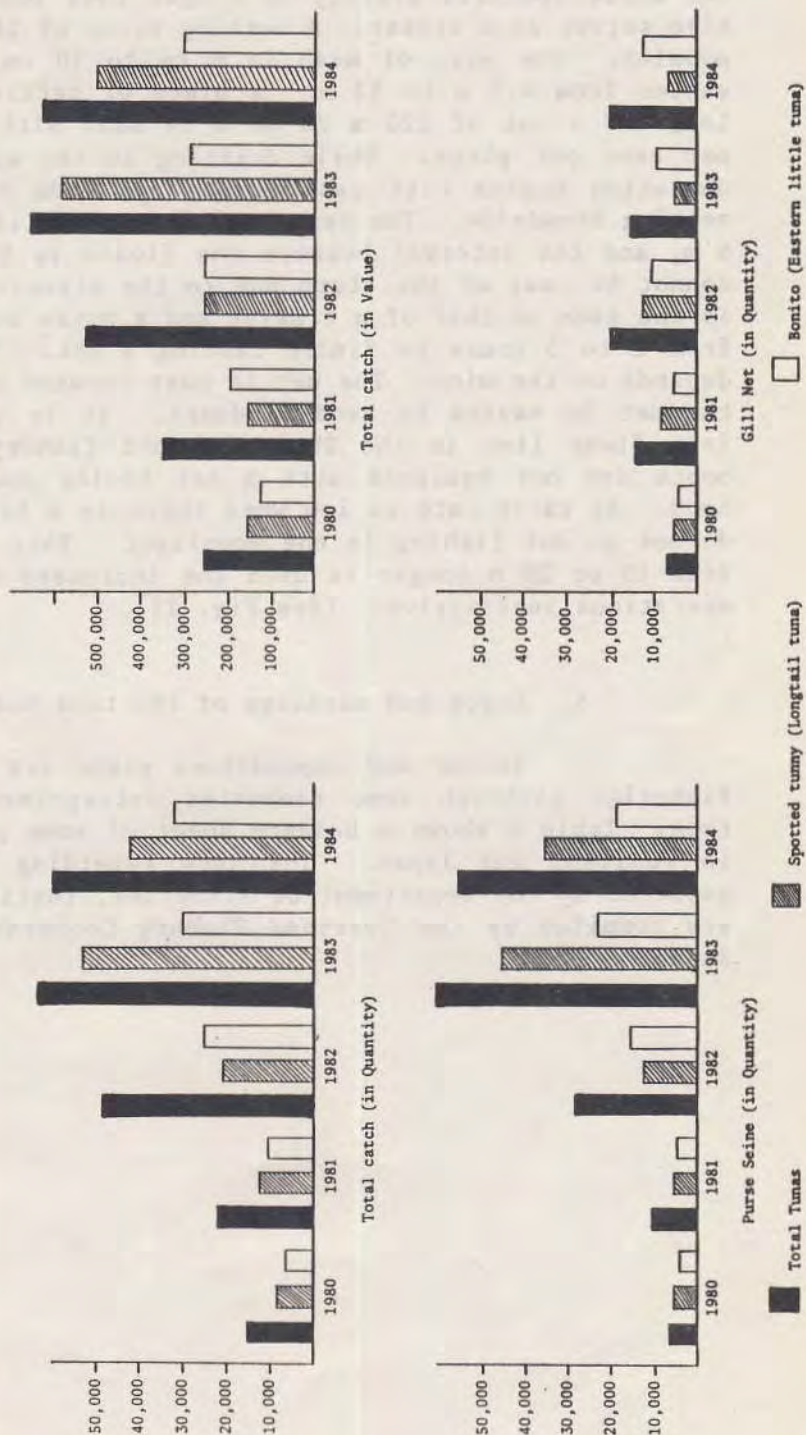
Fig. 21. Annual trends of tuna catch rate by drift gill net, 1979-1984.

Note : LOT : Longtail tuna (Spotted tunny)
TUN : Eastern little tuna (Bonito)

Source: Department of Fisheries, Thailand.

Table 5. Change of Thai tuna catch in quantity and value divided into groups by fishing gear and method. Source : Department of Fisheries, Thailand.

	1980				1981				1982				1983				1984			
	Total Tunas	Spotted tunny	Bonito	Total Tunas	Spotted tunny	Bonito	Total Tunas	Spotted tunny	Bonito	Total Tunas	Spotted tunny	Bonito	Total Tunas	Spotted tunny	Bonito	Total Tunas	Spotted tunny	Bonito		
Total catch (in Quantity)	13,291	8,279	5,012	21,990	11,338	10,652	49,065	23,174	25,891	85,760	53,745	32,015	76,725	44,265	32,460					
Total catch (in Value)	248,998	135,527	113,417	358,215	162,112	196,103	526,498	276,482	250,016	928,147	646,735	281,412	802,247	499,963	302,284					
By Purse Seine (in Quantity)	6,850	4,515	2,335	9,855	5,170	4,685	27,373	11,659	15,714	71,259	47,359	23,900	55,973	36,441	19,532					
By Gill Net (in Quantity)	6,431	3,754	2,677	12,133	6,166	5,967	21,567	11,515	10,052	14,500	6,386	8,114	20,751	7,824	12,927					



A drift net for Spanish mackerel is made of multifilament nylon and in some regions monofilament net is also used. A man rope is used at the float line for reinforcement. At the lower part, Saran net whose specific gravity is bigger than that of nylon is used, it also serves as a sinker. A netting twine of 210d/9 to 210d/18 is most popular. The size of mesh is 6 cm to 10 cm, and the depth of net varies from 4.5 m to 12 m. A piece of netting in Thailand is 200 m long and a net of 120 m to 80 m is made with shrinkage of 40 to 60 per cent per piece. While drifting in the wind at night, a fishing operation begins with casting the net made of 50 to 100 pieces of netting broadside. The length of float line is relatively short, 2 to 6 m, and the interval between the floats is 6 to 10 m. Since a net cannot be cast at the stern due to the structure of the vessel, which is the same as that of a trawler and a purse seiner, it takes anything from 2 to 5 hours to finish casting a net. The exact time required depends on the wind. The net is cast leeward and after a little while the net is hauled by hand windward. It is very difficult to use a long float line in the Thai gill net fishery, because most of the boats are not equipped with a net hauler and the net is hauled by hand. As catch rate is low when there is a bright moon lots of boats do not go out fishing in the moonlight. This is because when a float line 10 or 20 m longer is used the increased work time makes fishing operations ineffective. (See Fig. 22).

5. Costs and earnings of the tuna purse seine

Income and expenditure plans are not common yet in Thai fisheries although some fisheries enterprises have begun to adopt them. Table 6 shows a balance sheet of some purse seining activities in Thailand and Japan. The data regarding Thai purse seines are gathered by the Department of Fisheries, Thailand. The Japanese data are compiled by the Overseas Fishery Cooperation Foundation (OFCF), Japan.

GILL NET

Spanish mackerel

VESSEL

Loa 6 m
hp 7

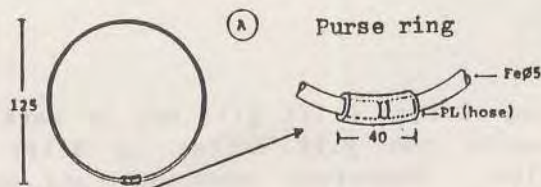
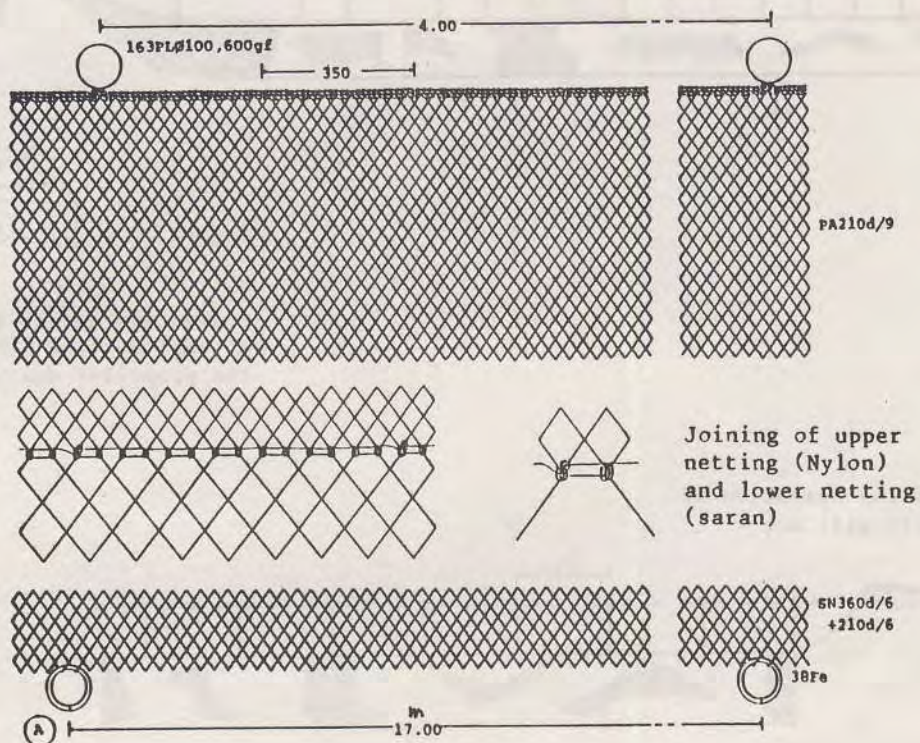
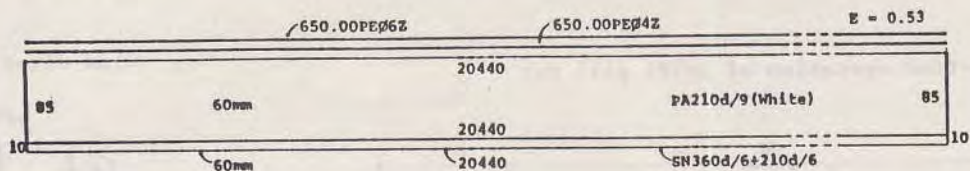
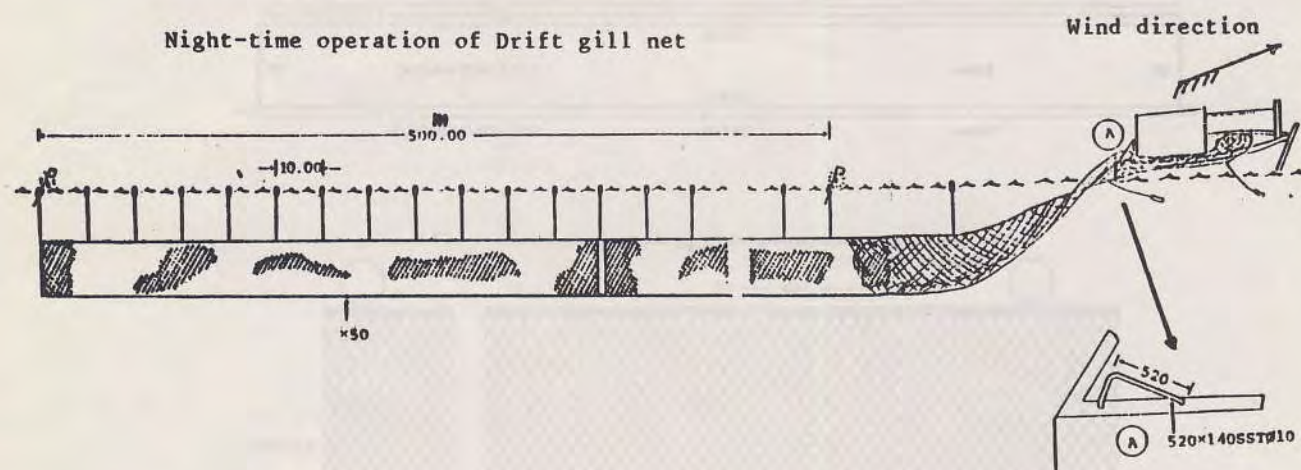


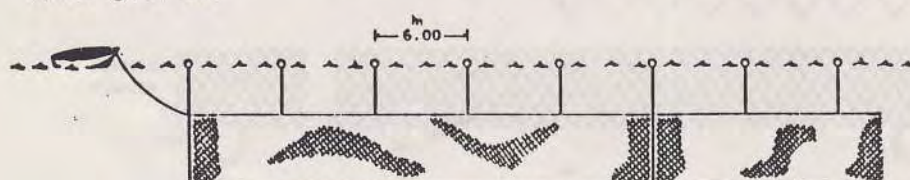
Fig. 22. Specification of drift gill net for Spanish mackerel and bonito, and its fishing operation.

Night-time operation of Drift gill net



Preventive device against entanglement of net with the propeller during shooting

Daytime operation of Drift gill net

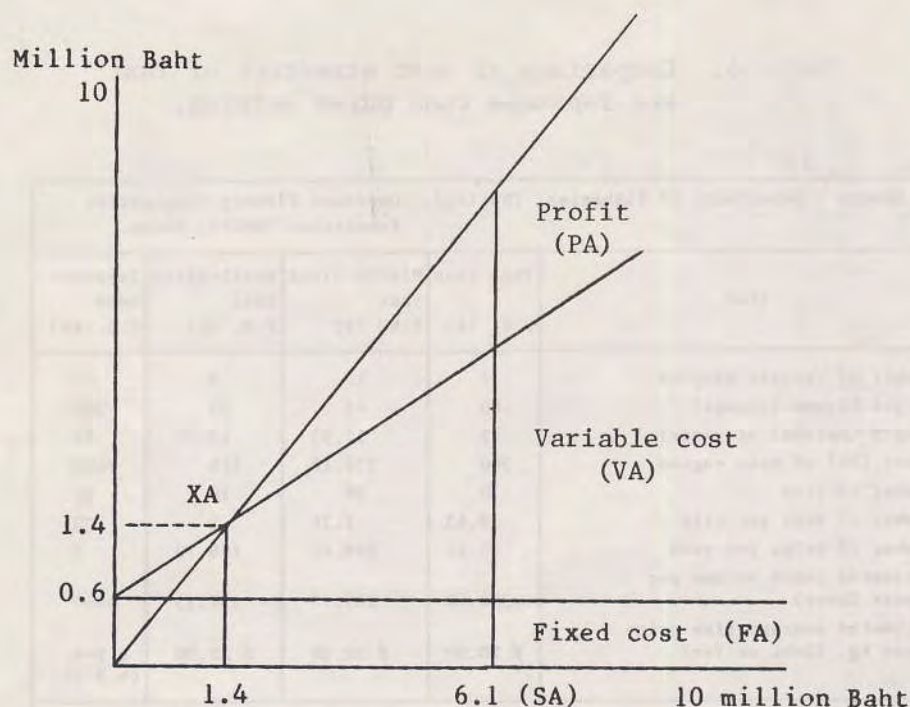


Note : Shooting of Thai Drift gill net is carried out only using the wind while the gill netter is drifting without using the propeller. Therefore shooting tuna depends on wind force. Almost all the gill netters do not have a net hauling device and the net is hauled by hand.

Source : Training Department, SEAFDEC.

Table 6. Comparison of cost structure of Thai and Japanese tuna purse seining.

Source : Department of Fisheries, Thailand. Overseas Fishery Cooperation Foundation (OFCF), Japan.				
Item	Thai tuna P.S. (A)	Middle-sized Thai P.S. (B)	Small-sized Thai P.S. (C)	Japanese tuna P.S. (D)
Number of vessels sampled	1	17	5	10
Weight (Gross Tonnage)	80	45	20	500
Length (Metres) of vessel	22	17.65	13.7	55
Power (PS) of main engine	300	224.18	216	2600
Number of crew	30	28	19	20
Number of days per trip	9.43	1.76	1	40
Number of trips per year	25.62	129.41	166.70	9
Estimated catch volume per year (tons)	304.60	183.10	157.35	4860
Estimated average fish price per kg. (Baht or Yen)	฿ 20.00	฿ 20.00	฿ 20.00	¥ 144 (= ฿ 24)
Type of cost	Average Cost per year of P.S.			
	(A)	(B)	(C)	(D)
1. Fixed Costs	1000 Baht 576	1000 Baht 492	1000 Baht 428	1000 Yen 317,520
1.1 Depreciation	244	109	82	110,200
1.2 Loan interest including opportunity cost	215	261	225	40,150
1.3 Fees including maintenance fee and some taxes	117	122	121	147,100
2. Variable Costs	3,390	1,400	810	303,520
2.1 Crew benefits	2,240	853	362	163,680
- Salaries and share	2,033	758	312	155,400
- Food expenses	207	95	50	8,280
2.2 Administration Costs	1,150	547	448	139,840
- Fuel and Lub. oil	732	304	275	66,600
- Ice or Salt	198	124	37	11,700
- Transport and Container	27	22	44	14,580
- Selling expenses	118	1	5	21,000
- Miscellaneous expenses including repairs and the other taxes	75	96	87	46,030
3. Total Costs	3,966	1,892	1,238	621,040
4. Gross income per year	6,092	3,662	3,147	700,000
5. Net income per year (profit)	2,126	1,770	1,909	78,960
Note : P.S. means Purse seiner				



Note : Formula of break-even point (XA) is as follows;

$$XA = FA / (1 - \frac{VA}{SA}) \div 1.4 \text{ (million baht)}$$

∴ FA : Fixed cost (0.6 million baht)

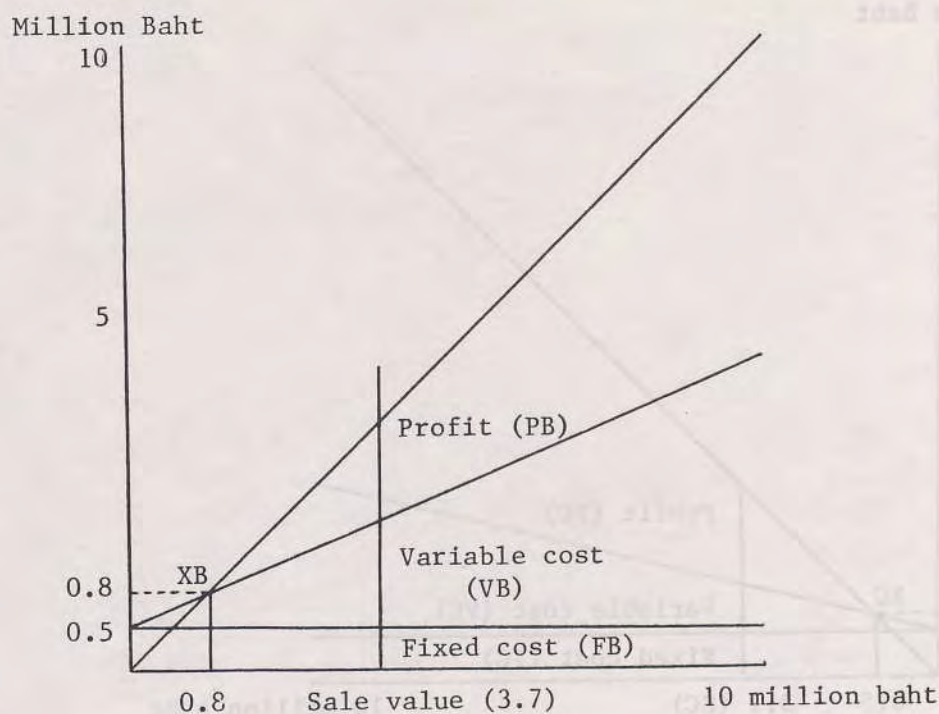
VA : Variable cost (3.4 million baht)

SA : Sale value (6.1 million baht)

According to the above graph, Profit (PA) is 1.9 million baht and the ratio of Profit to the sale value is 31.1 per cent.

Source : Figures 23-26, All figures are calculated and drawn on Table 7.

Fig. 23. Break-even point (XA) of Thai tuna purse seiner (80-ton type)



Note : Formula of break-even point (XB) is as follows;

$$XB = FB / (1 - \frac{VB}{SB}) \div 0.8 \text{ (million baht)}$$

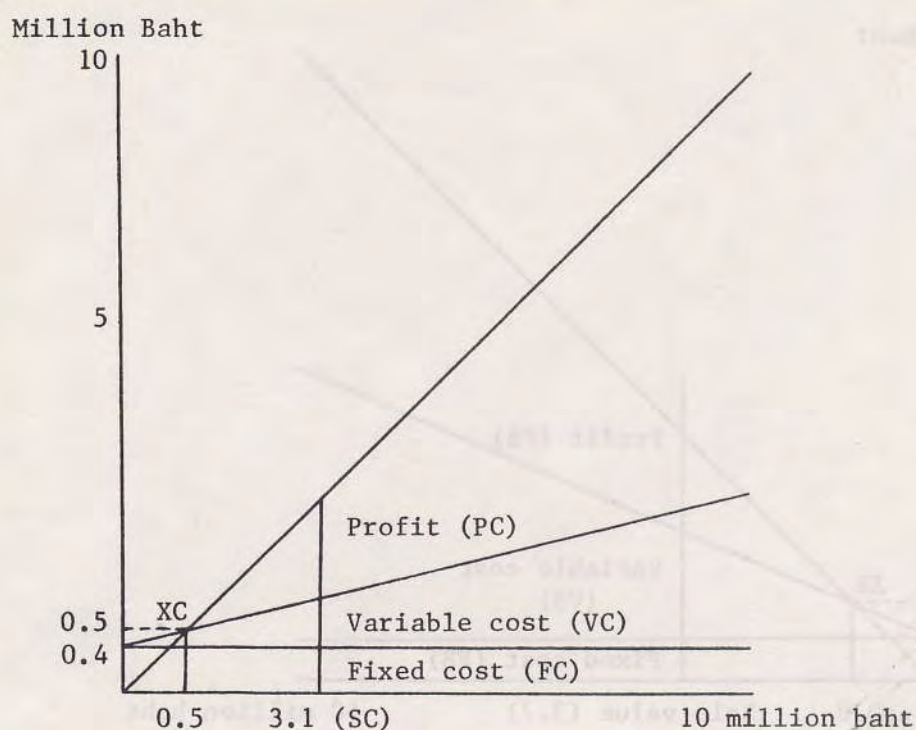
∴ FB : Fixed cost (0.5 million baht)

VB : Variable cost (1.4 million baht)

SB : Sale value (3.7 million baht)

According to the above graph, Profit (PB) is 1.8 million baht and the ratio of Profit to the sale value is 48.6 per cent.

Fig. 24. Break-even point (XB) of middle-sized Thai purse seiner



Note : Formula of break-even point (XC) is as follows;

$$XC = FC / (1 - \frac{VC}{SC}) \div 0.5 \text{ (million baht)}$$

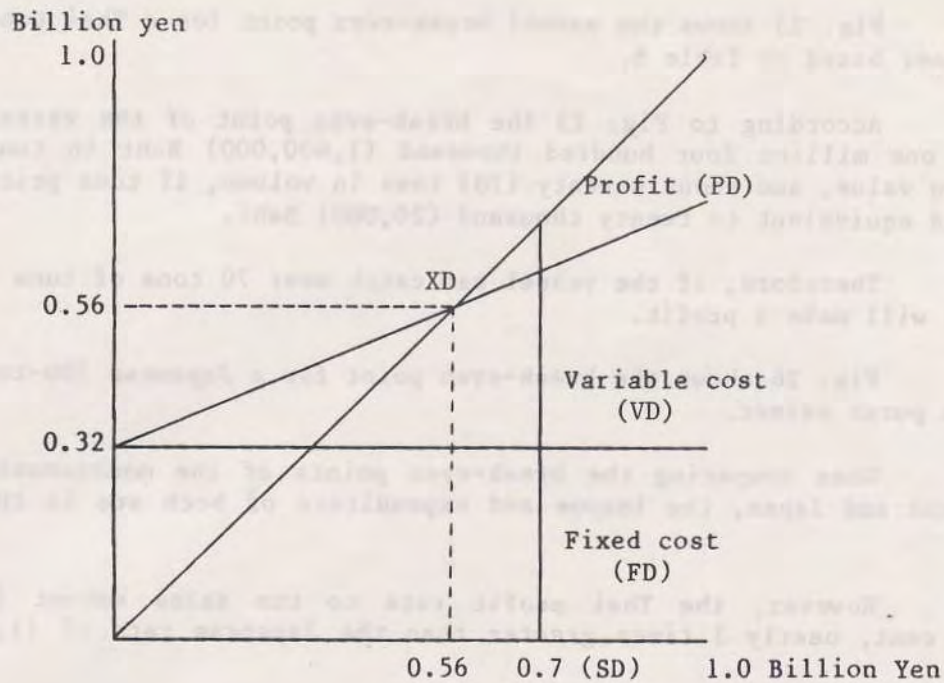
∴ FC : Fixed cost (0.4 million baht)

VC : Variable cost (0.8 million baht)

SC : Sale value (3.1 million baht)

According to the above graph, Profit (PC) is 2.1 million baht and the ratio of Profit to the sale value is 67.7 per cent.

Fig. 25. Break-even point (XC) of small-sized Thai purse seiner



Note : Formula of break-even point (XD)

$$XD = \frac{FD}{1 - \frac{VD}{SD}} = 0.56 \text{ (Billion Yen)}$$

FD : Fixed cost (0.32 Billion Yen)

VD : Variable cost (0.30 Billion Yen)

SD : Sale value (0.70 Billion Yen)

According to the above graph, Profit (PD) is 80 million yen and the ratio of profit to the sale value is 11.4 per cent.

Fig. 26. Break-even point (XD) of Japanese tuna purse seiner (500-ton type)

Fig. 23 shows the annual break-even point for a Thai tuna purse seiner based on Table 6.

According to Fig. 23 the break-even point of the vessel is about one million four hundred thousand (1,400,000) Baht in tuna production value, and about seventy (70) tons in volume, if tuna price per ton is equivalent to twenty thousand (20,000) Baht.

Therefore, if the vessel can catch over 70 tons of tuna a year, she will make a profit.

Fig. 26 shows the break-even point for a Japanese 500-ton type tuna purse seiner.

When comparing the break-even points of the managements in Thailand and Japan, the income and expenditure of both are in the black.

However, the Thai profit rate to the sales amount is 31.1 per cent, nearly 3 times greater than the Japanese rate of 11.4 per cent.

Therefore, Thai tuna fisheries seem to enjoy a very high profitability.

Moreover, there is a remarkable difference between Thai and Japanese break-even points. The Thai one is very low, equivalent to 23 per cent of annual catch value, while the Japanese one is very high, 80 per cent.

This is caused by the huge difference in the rate of fixed cost, since the variable cost of the Thai seiner is about 6 times the fixed cost, whereas the Japanese is only 0.9 times.

Japanese profitability is lower than Thai although investment in Japanese tuna vessels is by far higher than that in Thai ones.

If Thai and Japanese fishing vessels carry out fishing operations in the same fishing ground, the former which has over sixty (60) times as much competitiveness in the catch volume break-even point and three times the profit rate to the sales, will predominate.

V. PRESENT SITUATION OF THE TUNA CANNING INDUSTRY IN THAILAND

Thai tuna canning has rapidly made remarkable advances, taking advantage of the trends of the world tuna industry, namely, (1) a decline in the Philippines which was a leader in the export of canned tuna, (2) utilization of Taiwan's competitiveness in production and export of canned tuna, (3) expansion of main consumer market for tuna products, (4) a long-term slump in fish prices which enables the Thai industry to secure raw materials from neighbouring countries easily. The fact that qualified man power accepts low wages has also helped the growth of the industry in Thailand. However, the above-mentioned favorable trends are not all.

In addition, each company quickly established its own laboratory and invited quality controllers from the USA to ensure a thorough quality control of their products. Taking their advice, the companies studied and made a great deal of effort to produce and export canned tuna which satisfied the taste of Americans and met the standards for imports required by the US, FDA (Food & Drug Administration). Enthusiastically, new production technology and equipment were introduced and at the same time appropriate software and hardware were developed. Furthermore, each company adopted a total management system to decrease the costs of production.

In addition to the favorable trends of the world tuna industry, the efforts of the companies have led to the maintenance of high productivity.

1. Securing of raw materials

(1) Domestic production of tuna is as follows:

Year	Quantity (ton)
1979	17,000
1980	14,000
1981	23,000
1982	53,000
1983	86,000
1984	76,000

Note: See Fig. 13

It is reported that domestic production of tuna had drastically increased until 1983 and after that it dropped a little. In 1985 and 1986, production of approximately 80,000 tons was barely attained. This means an increase in production cannot be expected anymore because full use has already been made of the MSY of Thai waters, estimated at 80,000 tons/year by DOF for these 4 years. Thai tuna fishing boats, particularly large-scale purse seiners of more than 80 tons will necessarily expand fishing grounds and direct their interests to joint-ventures with neighboring countries in the future. This will result in increased tuna production in Thailand and the Thai tuna fishery will contribute to the Thai tuna canning industry by providing a stable supply of raw materials.

(2) Securing of imported raw materials for canned tuna

The importing of raw materials for canned tuna started at the beginning of 1980. It reached 30,000 tons in 1983, more than 100,000 tons in 1984 and 170,000 tons in 1985. It is expected to reach 190,000 tons in 1986 (See Table 7).

The Thai tuna canning industry tried to get raw materials from several countries at the beginning and now imports it from 15 countries (See Fig. 7). Ten of them are listed below in order of importance as follows:

1. America (USA)
2. France
3. Maldive Islands
4. Japan
5. Indonesia
6. Solomon Islands
7. Spain
8. Singapore
9. Papua, Territory of New Guinea
10. The Philippines

Table 7. Thailand : Exports of skipjack and bonito (in MT)

	1985				1984			
	Canned	Whole	Fillets	Dried	Canned	Whole	Fillets	Dried
Cyprus	40	-	-	-	18	-	-	-
Hong Kong	38	-	-	-	16	-	-	-
Israel	50	-	-	-	97	-	-	-
Japan	336	-	-	93	904	-	-	77
Kuwait	83	-	-	-	14	-	-	-
Malaysia	2,758	146	30	-	582	63	1	-
Saudi Arabia	158	-	-	-	74	-	-	-
Singapore	430	9	-	-	9	7	-	-
Sri Lanka	93	-	-	-	18	-	-	-
U A E	36	-	-	-	9	-	-	-
Belgium	306	-	-	-	162	-	-	-
Denmark	1,311	-	-	-	277	-	-	-
Finland	1,102	-	-	-	265	-	-	-
France	59	-	-	-	112	-	-	-
FR Germany	7,415	-	-	-	3,556	-	-	-
Greece	73	-	-	-	1	-	-	-
Iceland	29	-	-	-	30	-	-	-
Italy	54	-	-	-	91	-	-	-
Holland	1,569	-	-	-	369	-	-	-
Norway	158	-	-	-	58	-	-	-
Spain	29	-	-	-	30	-	-	-
Sweden	982	-	-	-	601	-	-	-
Switzerland	386	-	-	-	329	-	-	-
U K	5,590	-	-	-	1,571	-	-	-
Canada	3,002	-	-	-	1,224	-	-	-
U S A	59,221	-	-	-	27,691	16	-	-
Australia	1,635	-	-	-	923	-	-	-
New Zealand	30	-	-	-	22	-	-	-
Others	107	-	-	-	778	-	-	-
Total	87,107	155	30	93	39,834	86	1	77

Table 8. Thailand : Imports of skipjack and bonito, 1985 (in MT)

	Frozen	Fresh/chilled	Fillets (fresh/ chilled/frozen)
Indonesia	4,116	1,697	461
Japan	6,179	1,938	912
Malaysia	5	-	47
Maldives	6,686	2,473	494
Philippines	2,239	912	24
Singapore	2,079	1,759	-
Taiwan	225	380	-
France	3,685	6,832	-
USA	12,523	6,592	1,685
Spain	1,279	3,060	-
Panama	1,460	1	-
Australia	436	1	-
P N Guinea	3,586	-	-
Solomon Islands	3,788	2,007	1,398
Seychelles	920	866	-
Total	49,209	28,942	4,988

Source : Thai Department of Business Economics,
Ministry of Commerce.

The competitiveness of canned tuna from Thailand is mainly maintained by high productivity and low wages for employees. It also depends on the cost of raw materials. The price of tuna hovered around 100 yen/kg during November 1986 to February 1987, and at the end of 1986 it dropped to 90 yen/kg. However, it rose to 160-170 yen/kg at the beginning of March 1987 and at the end of that month rapidly to 200 yen/kg. (Note: One US dollar was equivalent to approximately 160 yen during the same period).

This is probably the cause of the decrease of tuna catch in the world and not because of an increase in demand and consumption. As tuna is international merchandise, once the balance between its supply and demand is lost the price which has been kept at a fixed level drastically fluctuates. Therefore, if the lack of raw materials becomes more serious, it can not be foretold how far the price will continue to rise. Since the break-even point of Thai canned tuna is said to be approximately 117 yen/kg (700 US dollars/ST), if it remains at a level higher than 117 yen/kg for a long time the Thai canned tuna

industry will lose its strong competitiveness which it held until last year. If the price reaches 133 yen/kg (800 US dollars), a serious situation of non-delivery will occur or if the higher level is kept for a long time, not only the packers of canned tuna in Thailand but packers throughout the world will have difficulty in carrying on business.

Nevertheless, the number of large-scale tuna purse seiners in the world is 160, and by 1990, it is expected to be 200.

Note-2

America operates 80 purse seiners in the western and eastern Pacific, France and Spain 30 purse seiners in the Indian Ocean, Korea 7 purse seiners (expected to be 14 in two years) and Taiwan 6 purse seiners (expected to be 20 in three years). Japan operates 32 purse seiners in the southwestern and south Pacific as do Korea, Taiwan, America and the Philippines. Including Mexican purse seiners, about 200 purse seiners will be operated in the world by around 1990.

Fig. 27 shows the change of average monthly Ex-vessel tuna price for Japan and America. According to this figure, the tuna price fluctuates between 600 dollars/ST and 900 dollar/ST, and the average price is a little less than 750 dollars/ST.

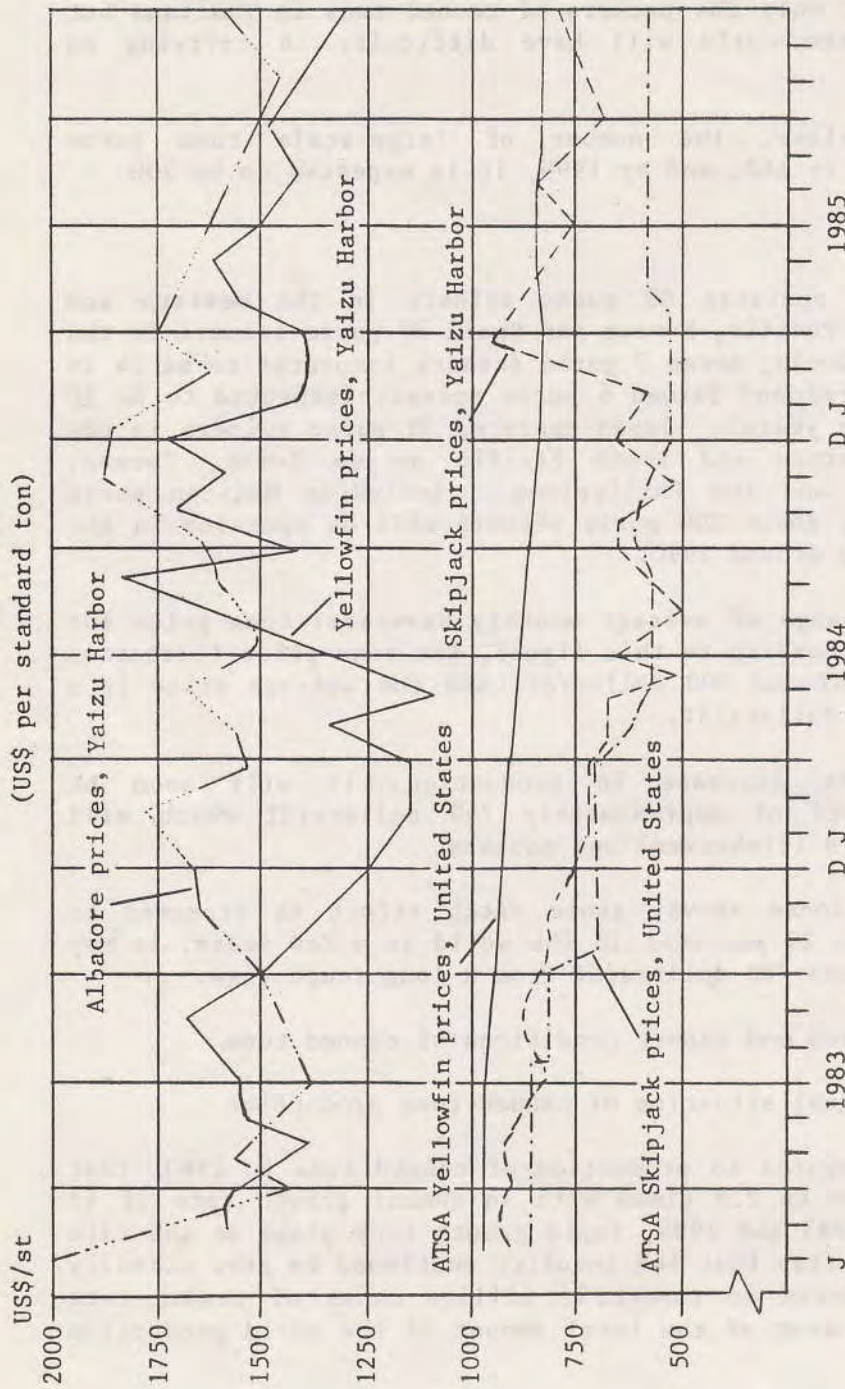
With the increase in production, it will soon be stabilized at a level of approximately 750 dollars/ST which will satisfy both producers (fishermen) and packers.

As mentioned above, since catch effort is expected to increase by more than 20 per cent in the world in a few years, it may be stabilized at around 700 dollars/ST from a long-range view.

2. Production and export conditions of canned tuna

(1) Actual situation of canned tuna production

Compared to production of canned tuna in 1980, that in 1983 had increased by 2.6 times with an annual growth rate of 61 per cent. Between 1983 and 1984, rapid growth took place at the rate of 100 per cent and after that the industry continued to grow steadily. In 1986 it was expected to export 12 million cases of canned tuna equivalent to 15 per cent of the total amount of the world production of 80 million cases.



Source : GLOBEFISH

Note : American Tuna Sellers Association (ATSA) is an organization established by the owners of American tuna purse seiners. Its purpose is to sell their tuna catch in the most profitable way.

Fig. 27. Average monthly ex-vessel tuna prices, Japan and the United States, 1983-1985.

Table 9. Production of Thai canned tuna by type of commodity.

unit : 1000 cases

Item	Year	1980	1981	1982	1983
(1) Canned tuna in oil		300	550	700	900
(2) Canned tuna in water		700	900	1,100	2,300
(3) Others		400	500	800	400
(4) Total		1,400	1,950	2,600	3,600
(5) Increasing rate		70%	75%	72%	
(6) Ratio of canned tuna in water to Total canned tuna $\left[\frac{(2)}{(4)} \times 100 \right]$		50%	46%	42%	64%

Source : Bangkok JETRO (Japan Trade Center)

Note: One can of canned tuna is 200 gr
(Standard size of canned tuna) x 48 pcs.

(2) The Unicord Investment (Thailand) Co., Ltd.

Established: 15 August 1978

Number of employees: 2,100

A : Production and sales amount

In 1986 this company produced 250 tons per day, that is, 12,500 c/s (1 case: 48 x 6.50 OZS). They also produce a small amount of canned sardines, horse mackerel and pet food. It has the largest factory, not only in Thailand but in Asia.

B : Capacity of production and operating rate

The company has 8 seamers, 14 retorts (18 feet), 6 tuna pack shapers (made in Japan) and 2 other pieces of equipment. 250 cans are produced per minute by 1 three-piece set (ordinary) canning line, and another 3 two-piece canning lines are also operated (made in Taiwan). Canning machines for large-sized cans (2 kg) and a welding canning line are also used to produce cans for the company itself.

It has freezer capacity of 5,500 tons including one new one of 3,000 tons. The company has been developed to operate fully throughout the year and keep an operating rate of 100 per cent. At present it sells the products to many countries through big Japanese trading companies such as Mitsubishi, Nozaki, Mitsui and Kanematsu; Ban Camp and Bumblebee in America; Princess and J.W.F. in England; and Migross in Switzerland. Annual output is as follows:

Year	1982	1983	1984
Production of canned tuna			
unit : Thousand cases			
Volume	800	1,400	2,900
unit : million baht			
Value	442	708	1,467

C : Expenses for production of canned tuna and factory-gate price are shown in the following table of production costs;

(3) Scale of canning factories in Thailand

In all, there are 30 canning factories in Thailand and they are classified as follows:

A group; Large-scale factory

Conditions: daily output is more than 5,000 c/s (48/6.5 OZS), annual operating rate is more than 90 per cent and more than 1,000 factory girls work in the factory which is equipped with modern canning machines, freezers and refrigerators. Tuna raw materials are imported and the factory is operated throughout the year.

Production costs of canned tuna in Thailand

Source : Unicord co., Ltd (Sept, 1984)

Item	Size of canned tuna	Expenses of production for one case of (48 pcs x 6.5 ozs) of tuna chunks in water	Local longtail tuna	Imported skipjack	Expenses of production for one case of (6 pcs x 66.5 ozs) of tuna chunks in water	Local longtail tuna
Raw materials prepared						
Costs of raw materials (CRM) per one case		18 baht/kg x 19 kg/case = 342 baht/case	18 baht/kg x 21 kg/case = 378 baht/case	18 baht/kg x 24.8 kg/ case = 447 baht/case	18 baht/kg x 26.5 kg/ case = 477 baht/case	
Costs of empty can per one case		1.85 baht/can x 48 can/ case ÷ 90 baht/case	1.85 baht/can x 48 can/ case ÷ 90 baht/case	12.5 baht/can x 6 can/ case = 75 baht/case	12.5 baht/can x 6 can/ case = 75 baht/case	
Costs of carton		6 baht/case	6 baht/case	12 baht/case	12 baht/case	
Costs of label		5 baht/case	5 baht/case	4 baht/case	4 baht/case	
Labor costs		23 baht/case	23 baht/case	23 baht/case	23 baht/case	
Others (ex. factory costs, transportation fees, etc.)		40 baht/case	40 baht/case	40 baht/case	40 baht/case	
Deduction from CRM (ex1: meat for pet food)		-16 baht/case	-16 baht/case	-19 baht/case	-20 baht/case	
Deduction from CRM (ex2: wastes - fish meal)		-17 baht/case	-18 baht/case	-21 baht/case	-23 baht/case	
Total production cost (= factory-gate price, FOB price in baht)		473 baht/case	508 baht/case	561 baht/case	588 baht/case	
FOB price/case in US dollars		20.57	22.08	24.40	25.57	

Note: 1) Prices of imported skipjack and local longtail tuna are US dollars 700/ST (÷ 18 baht/kg) and 18 baht/kg respectively.

2) Ratios of meat for pet food and of waste such as bone, skin and internal organs to full body weight of fish are 8 and 60 per cent respectively.

3) One US dollar was equivalent to about 23 baht on 30 September 1984.

4) A factory girl was paid 80 baht per day in other words 10 baht per hour.

B group; Middle-scale factory

Conditions: the output per day is more than 1,500 c/s and the annual operating rate is 80 per cent.

C group; Small-scale factory

Conditions: the output per day is about 1,500 c/s and the annual operating rate is less than 50 per cent.

The following are the names of companies which are included in the above 3 groups:

A group; UNICORD, T. UNION, SAFCOL, T. KONG.

B group; PATTAYA, TROPICAL, K.H. SEAGULL, B & M.

C group; T.OVERSEA, R.S., and others

(4) Quality control and level of technology

A) Standard of export

Products are not necessarily inspected before shipment. A statutory export standard does not exist, but each packer independently controls the quality of his products. Most of the packers establish their own quality control section to maintain the high quality of their products.

A standard set up by the government is P.K. numbers which are issued by the Ministry of Welfare. Packers should apply for one and print it on the label of each can before export.

[Application for P.K. No.]

In order to get a P.K. No., packers should send their trade sample for analysis to the Science Department of the Ministry of Welfare and then attach the result to an application form. It takes a few months to finish all the procedures. A P.K. number is registered according to the kind of product. If a packer produces canned food of different grades, he should register each grade of product.

TUNA CHUNKS IN OIL

TUNA CHUNKS IN BRINE

TUNA SOLID IN OIL/BRINE

When a packer uses several labels for products of the same quality and grade, he can print the P.K. number he already has on each. However, he should report this to the authority concerned in advance.

B) Quality control system

The government has established no special quality control system other than the above-mentioned P.K. number. In general, packers or buyers independently inspect products before shipment.

Table 10. Exports of Thai canned fish by destination (1980-1983).

Unit : Amount (tons)
Value (1,000 Baht)

Year Destination	1980		1981		1982		1983	
	amount	value	amount	value	amount	value	amount	value
1. U.S.A.	3,572	221,489	5,273	329,132	12,270	657,059	23,277	1,163,473
2. W. Germany	915	53,148	2,118	129,726	4,900	226,173	5,395	253,404
3. Australia	4,185	117,878	4,161	113,018	5,999	146,005	3,995	102,340
4. Canada	118	7,160	152	9,613	348	21,050	2,154	127,873
5. Malaysia	382	5,706	700	12,447	1,178	22,808	2,045	37,015
6. Jamaica	-	-	191	4,309	2,356	57,692	2,159	48,000
7. Sweden	1,087	58,395	1,461	91,490	1,595	89,498	1,282	70,790
8. U.K.	595	32,666	723	36,843	838	34,690	1,242	44,614
9. Denmark	354	21,746	394	24,292	596	32,900	800	40,005
10. Finland	210	13,519	530	30,411	599	33,539	596	30,016
11. Saudi Arabia	82	5,811	205	15,692	821	24,584	574	22,280
12. Netherland	121	4,592	630	34,466	861	46,074	702	31,343
13. Belgium	37	574	205	10,541	356	17,586	156	6,834
14. Japan	72	1,471	135	2,857	258	5,606	664	17,479
Total	14,159	603,393	28,371	1,109,477	43,706	1,664,511	49,947	2,115,928

Source : Foreign Trade Statistics, Department of Customs, Thailand (1980 - 1983)

Table 11. Thai canned tuna exports by destination.

Amount (ton)
Unit : Value (1,000 Baht)

Year Destination	1984	Share %	1985	Share %	Increasing rate to the previous Year	1985 (Jan.-Aug.)	Share %	1986 (Jan.-Aug.)	Share %	Increasing rate to same period of the previous Year
U.S.A.	Value 1,339,159	72.2	3,130,180	67.8	233.7	2,066,478	69.4	2,726,972	55.2	132.0
	Amount 27,691	69.5	59,249	68.0	214.0	38,704	69.8	51,761	55.9	133.7
W. Germany	Value 152,857	8.2	375,742	8.1	245.8	213,398	7.2	359,503	7.3	168.5
	Amount 3,556	8.9	7,415	8.5	208.5	4,012	7.2	7,551	8.2	88.2
U.K.	Value 66,517	3.6	289,435	6.3	435.1	186,759	6.3	766,272	15.5	410.3
	Amount 1,600	4.0	5,590	6.4	349.4	3,527	6.4	14,002	15.1	397.0
Canada	Value 69,361	3.7	183,203	4.0	264.1	93,752	3.1	336,309	6.8	358.7
	Amount 1,224	3.1	3,002	3.4	245.3	1,535	2.8	5,250	5.7	342.0
Japan	Value 19,825	1.1	8,946	0.2	45.0	4,721	0.2	23,599	0.5	499.8
	Amount 904	2.3	336	0.4	37.2	187	0.3	567	0.6	303.2
Others	Value 206,689	-	-	-	-	-	-	-	-	-
	Amount 6,487	-	-	-	-	-	-	-	-	-
Total	Value 1,854,408	100.0	4,619,876	100.0	249.1	2,977,296	100.0	4,947,522	100.0	166.2
	Amount 39,862	100.0	87,134	100.0	218.6	55,419	100.0	92,591	100.0	167.1

Source : Department of Customs (1984-1985) 1 Baht was about ₪ 9 in 1985.
Department of Business Economics, Ministry of Commerce, Thailand
(Jan. - Aug. 1986) 1 Baht was about ₪ 6 in 1986.

Table 12. Volume and value of Thai canned fish exports.

Destination	1979		1980		1981		1982		1983 (Jan.-Sept)	
	Volume		Volume		Volume		Volume		Volume	
	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value
U.S.A.	2,506	124.9	3,572	221.5	5,237	329.1	12,270	657.1	16,687	850.1
France	77	2.8	45	2.1	194	11.7	124	6.6	119	6.2
W. Germany	1,038	46.8	915	53.1	2,118	129.7	4,900	226.2	3,681	173.8
Australia	2,536	58.7	4,185	117.8	4,161	113.0	5,999	146.0	3,406	87.6
United Kingdom	341	12.4	595	52.7	723	36.8	839	34.7	995	35.2
Sweden	1,069	46.6	1,087	58.4	1,462	91.5	1,595	89.2	931	51.5
Canada	33	2.1	118	7.2	152	9.6	348	21.1	1,411	86.7
Nigeria	-	-	13	0.3	2,722	51.9	2,542	55.6	411	10.1
Sri Lanka	692	11.6	1,002	16.2	1,511	23.8	2,681	47.6	636	11.7
Others	2,260	67.6	5,506	457.1	10,091	312.3	12,408	380.4	9,127	250.0
Total	10,552	373.5	17,038	986.9	28,371	1,109.4	43,706	1,664.5	37,404	1,562.9

Source : Trade Statistics Center, Department of Business Economics and Department of Customs.

Remark : Data for 1983 is tentative.

Volume : Tons
Value : Million Baht

Table 13. Imports of tuna to Thailand by country of origin (1984)

D E S C R I P T I O N	Dec. 1984.....		Jan.-Dec. 1984.....	
	Quantity	C.I.F.Value (Baht)	Quantity	C.I.F. Value (Baht)
Skipjack and Bonito fresh chilled (kg)				
Malaysia			3,600	18,075
Singapore			84,000	1,495,670
			87,600	1,513,745
Skipjack and Bonito fillets frozen (kg)				
Indonesia			351,359	5,435,862
Japan			299,110	4,804,598
United States			967	18,065,697
			651,436	28,306,157

Table 14. Imports of tuna to Thailand by country of origin (1985)

D E S C R I P T I O N	Dec. 1985.....		Jan.-Dec. 1985.....	
	Quantity	C.I.F.Value (Baht)	Quantity	C.I.F. Value (Baht)
Skipjack and Bonito fresh chilled (kg)				
U.S.A.	1,844,000	49,987,387	6,591,746	183,598,468
	6,880,208	187,646,728	30,061,680	800,949,125
Skipjack and Bonito frozen (kg)				
Australia			436,800	12,442,650
Spain			1,279,000	35,470,936
France			3,684,600	98,906,949
Indonesia	352,000	9,503,636	4,116,124	113,928,198
Japan			6,179,429	141,406,610
Maldives	1,792,277	48,309,750	6,685,802	214,883,262
Malaysia			5,900	38,711
Panama			1,460,000	40,495,741
Papua New Guinea	447,700	12,045,726	3,586,360	97,925,965
Philippines			2,239,132	63,034,575
Solomon Islands			3,787,577	104,158,388
Seychelles	920,900	24,965,706	920,000	24,965,706
Singapore	161,480	4,382,333	2,079,475	55,682,531
Taiwan	75,000	2,032,058	225,000	6,142,340
U.S.A.	1,850,668	50,323,611	14,372,158	427,761,362
	5,599,125	151,562,820	51,057,357	1,437,263,944
Skipjack and Bonito fillets fresh chilled (kg)				
Malaysia	7,000	45,481	32,450	216,756
	7,000	45,481	32,450	216,756
Skipjack and Bonito fillets frozen (kg)				
Indonesia			460,892	10,288,669
Japan			911,980	21,745,646
Maldives			494,384	9,043,879
Malaysia			14,260	95,113
Philippines			24,000	683,576
Solomon Islands			1,397,905	39,879,147
U.S.A.			1,648,966	57,935,173
			4,988,367	139,671,203

Source : Department of Customs, Thailand.

(5) Actual situation of export of canned tuna:

Statistics for exported canned tuna were not compiled until 1983 and canned tuna was previously included in canned fish along with canned sardine, etc. However, it has also been found that the statistics for imported tuna raw materials before 1984 were not incomplete when compared with each other. Though Tables 13 and 14 are data on import conditions of tuna into Thailand, they have no relevance to the data on exported canned tuna.

(6) Channels of export:

(A) Packer— buyer at destination (import country).

A packer closes a transaction with a buyer directly by telex. The buyer then opens a letter of credit to the packer. 80 per cent of transactions are carried out in this way.

(B) Packer— intermediary trading company— buyer.

A buyer is introduced to a packer by a Japanese or a Thai trading company. In this case, L/C is directly opened to a packer by a buyer, or a trading company takes part in opening L/C. Generally this type of transaction is carried on a few times then the packer will start to do business with the buyer directly. 20 per cent of transaction are carried out in this way.

VI. PROSPECTS OF THE TUNA INDUSTRY IN THAILAND

The Thai tuna industry has benefited since its conception from cheaper raw materials, supplied by the Thai tuna fishery, than the international market price. It is desirable for the industry to get the necessary quantity of raw materials, of uniform quality and size, at a reasonable and stable price. The Thai tuna fishery once satisfied the demand from the canning industry almost in excess.

However, since the later half of the 1970s the fishery has not been able to meet the demand due to the rapid growth of the canning industry, especially nowadays, as shown in the following data.

According to the data in Table 15 only 23 per cent of tuna raw materials was supplied to the canning industry by the fishery in 1985. In 1986 less than 20 per cent was expected to be supplied.

Table 15. Tuna production and consumption in Thailand (1985-1986)

unit: 1,000 tons

	1985	1986
(1) Tuna production in Thailand	80	80
(2) Tuna imported to Thailand	170	190
(3) Tuna consumption in Thailand	250	270
(4) Tuna consumption of canned tuna in Thailand	Note 1 220	Note 2 240
(5) General tuna consumption in Thailand	30	30

Note 1 & 2 : 220,000 and 240,000 tons of tuna are equivalent to 11 and 12 million cases of canned tuna in standard cases (200 gr. x 48 pcs), respectively.

Source : Figures are estimated and from several data sources, namely, the statistics of the Department of Fisheries and the Department of Customs, Thailand.

Note-3

Some exporters of Thai canned tuna said that judging from the capacity of production and various conditions surrounding the industry, it seemed to be impossible for the industry to produce 10,000,000 cases in 1985 and the production amount was estimated at 8,000,000 - 8,500,000 cases.

1. Tuna fishery

Annual catch of tuna (mainly longtailed tuna and mackerel tuna) was around 80,000 tons during the period 1979 to 1983 and reached the upper-most limit in Thai waters, namely the Gulf of Thailand and the Andaman Sea. Since, according to the Thai Department of Fisheries, MSY in the Gulf of Thailand is about 60,000 tons a year and that in the Andaman Sea, 20,000 tons a year, an increased catch could not be expected even if more catch effort were made.

Even now overfishing is apparent from the size of both tuna schools and individual which have been becoming smaller and smaller. Therefore, some actions should be taken immediately to preserve tuna resources.

Fishing gear for tuna are purse seine and gill net in Thailand. Since purse seiners which are large-scale boats are generally used they can be operated outside Thai waters. Gill net, however, use small- or middle-sized boats and are not suitable for long cruises. To make full use of existing fishing boats, technology and crews, fishing grounds should be expanded beyond Thai waters, especially for large-scale boats.

The EEZ of Thailand borders on those of Cambodia, Viet Nam, Malaysia, Indonesia, Burma, India and Bangladesh. It is most desirable that the countries concerned come to an agreement with Thailand regarding fishing operations by Thai boats in fishing grounds outside Thai waters.

If an agreement is made with Malaysia, Thailand will be able to expand its fishing grounds. As Thailand has a more developed fishery than Malaysia and Indonesia, the advance of Thai fishing boats into these waters would help the Thai tuna industry develop further. In order to meet the demand to increase the rate of self-supplied tuna raw materials to the Thai tuna canning industry, large-sized boats must extend their fishing operations beyond Thai waters. Therefore, it is desirable that gill netters operate inside Thai waters and purse seiners outside them. It is vital that this expansion of fishing grounds be supported by the united effort of the Thai Government and the Thai tuna industry.

At present, most of the world's tuna purse seiners are American-type purse seiners which have been improved to attain the highest productivity, along with large-scale trawlers.

However, it is doubtful that this type of purse seiner was introduced into Thai fishery for the purpose of improving productivity because the introduction of American-type purse seiners requires:

- (1) enormous investment (See Table 6 on page 49)
- (2) retraining of crew
- (3) further expansion of the fishing grounds

Thailand is blessed with cheap human resources of quality which is different from advanced countries in fishery such as Japan and America. Rationalization of the tuna fishery in Thailand will naturally cause instability of employment.

Even if higher productivity is attained, the Thai fishery is unlikely to reach a level to ever carry out a worldwide fishing activity. In addition fishing grounds are limited inside the EEZ of neighbouring countries and so is the amount of resources. Therefore, it is questionable as to whether the introduction of American type purse seines would increase the catch. Their introduction will result in a refusal to meet the demand of society for employment opportunities and at the same time there is the possibility that the tremendous investment will cause a rise in production costs. It has long been said that fishery, scientifically and technologically falls behind other industries. The Thai fishery should make full use of existing gears and methods and develop what it already has.

At present, the ice storage method is used to preserve fish on Thai tuna purse seiners. If a pelagic fishery is started in the future, this means that the Thai fishing boats will enter the international competition for tuna. They will have to pay more attention to the quality of their catch to be accepted in the international market. They will need to change preservation methods from ice storage to a sea water cooling system or brine freezing system. Even if they get a good catch, fish of low quality do not fetch much, and their return will not cover the expense of fuel oil or wages.

Thai fishermen engaged in tuna fishery tend to lack an understanding about freshness of catch. Though it is difficult for them to acquire such knowledge in a short time, the problem will be solved by emphasis from the Thai tuna canning industry on freshness.

The number of American type large-scale purse seiners is increasing, and will reach 200 by 1990, particularly with the increase in size of Korea's, Taiwan's and Mexico's fleets. However, it is more advisable that the Thai fishery concentrate itself on the development of the Thai tuna industry, maintaining present production costs without the introduction of larger-sized boats.

2. Tuna canning industry

Thai tuna canning industry has unprecedentedly developed in a short time. In 1985, the output of canned tuna in Thailand amounted to 12 per cent of world consumption, and 24 per cent of the canned tuna consumed in America, the largest market in the world, was imported from Thailand. Canned tuna produced in Thailand accounted for 57 per cent of the canned tuna imported by the U.S.A. in 1986.

Thai canned tuna is said to be cheap, of quality and delicious. In 1986, 324 million dollars was made by exporting 12 million cases of tuna.

Japan and Taiwan started to produce and export canned tuna soon after World War II. First of all, products were not for domestic consumption but mainly for export to North America, Western Europe and the Middle and Near East. Thus, the industry rapidly developed. But during the period of high economic growth a sudden rise in personnel expenses increased the production cost of canned tuna in Japan. As a result the industry ceased growing or was compelled to grow very slowly.

At that time, seizing the opportunity, the tuna canning industry of Taiwan developed for a while. However, it failed to continue to grow more due to a sudden rise in manpower costs similarly to Japan. The Philippines took the place of Taiwan from 1980 to 1982. During that time their production and export of canned tuna considerably expanded and the Philippines ranked second to Japan in tuna exports to America. However, as the Philippines suffered foreign currency problems, it had considerable difficulty in securing tuna raw materials. In addition, the Philippines was not capable of further developing its tuna canning industry, like Japan and Taiwan, because of the worsening political situation. Taking advantage of the circumstances, Thailand utilized the technology and investment of Taiwan and attained record growth. (See Fig. 28) Japan ranked first in tuna exports to America up until 1984. The amount of canned tuna production in Thailand did not reach 500 tons until 1980. Thailand then made rapid progress and ranked fourth in export to America in 1981. Thailand occupied the first place in 1984 and since then second place has shifted between Japan, the Philippines and Taiwan.

Note: One ton of tuna raw material can produce 50 cases (200 g. x 48 pcs.) of canned tuna

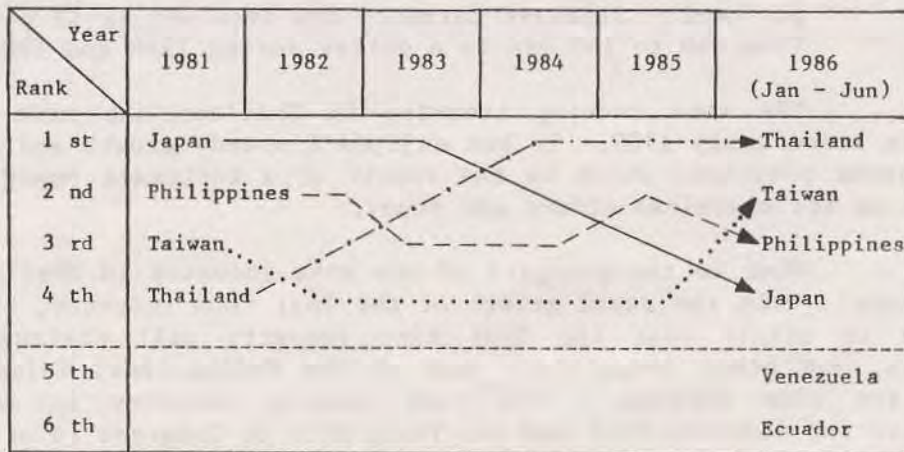


Fig. 28. Changes in ranking order of canned tuna exporting countries to the U.S.A.

Source : Ministry of Commerce, U.S.A.

The difference between the second, third and fourth places is small, while that between the first and the second place has been getting bigger and bigger every year. In 1985 Thailand exported twice as many products as the Philippines in second place and in the first half of 1986 (from January to June) 5.5 times as many products as Taiwan in second place, when canned tuna from Thailand amounted to 65 per cent of the total imported canned tuna in America. 6 million 250 thousand cases of canned tuna were exported to America in 1985 and in the first half of 1986, 4 million 500 thousand cases. If the same amount of product is exported as in the second half of the previous year, the total amount of exports will be 7 million cases, which means that 70 per cent of the canned tuna imported by America will come from Thailand in 1986.

Why has the Thai canning industry succeeded in the American market like this? It is because of an unthinkable exchange rate between yen and dollars, that is, a strong yen and a weak dollar (See Note-4). For two years Japanese currency has been devalued by 33 per cent from 240 to 160 yen to a dollar, due to this the competitiveness of Japan in exporting canned tuna was lost.

However Thai currency saw the opposite trend and went up by 13 per cent from 23 to 26 baht to a dollar on 5 November 1984. Therefore, the competitiveness of the Thai canned tuna industry became stronger than ever.

Note-4

After World War II, the exchange rate of yen to dollars was 360 yen to a dollar. In 1984, 40 years later, it was 240 yen to a dollar with a devaluation rate of about 33 per cent. Japanese currency was devalued by 33 per cent from 240 to 160 yen to a dollar during 1984 and 1986.

The tuna canning industry in Thailand has made great progress since early 1980. It has enjoyed a steady growth and gained its present position, which is the result of a fortunate opportunity as well as its ceaseless effort and study.

What is the prospect of the tuna industry in Thailand in the future? With the rapid growth of the Thai tuna industry, that of America is afraid that the Thai tuna industry will obstruct its business, and other competitors such as the Philippines, Taiwan and Japan are also nervous. The tuna canning industry in America submitted the Anderson Bill and the Young Bill to Congress in order to arrest the advance of imported canned tuna in America or, if possible, reduce the amount. In the Anderson Bill, a raising of the tariff from

12.5 to 35 per cent and in the Young Bill from 12.5 to 24 per cent was requested. Those two bills were not taken up because the unfair importation of canned tuna was not recognised. The tuna canning industry in America was not satisfied with the result and started a campaign to appeal to public opinion through mass communication, to raise a tariff on imported canned tuna, in addition to lobbying for more control on imported canned tuna.

On the other hand, the Thai tuna industry also lobbied and employed lawyers to bring about the withdrawal of the restrictions on importing canned tuna, and at the same time the problem was repeatedly talked over with the tuna industry in America. Japan and Taiwan have been decreasing their overseas market share due to the increase of their production costs, which makes it easier for Thailand to advance abroad. However, the tuna industry in America will continue their campaign against imported canned tuna.

In addition, the output of canned tuna has been steadily increasing in the overseas factories of the American tuna industry. Venezuela and Ecuador, rising countries in canned tuna exports, have entered the American market.

Furthermore, the Thai tuna canning industry should pay attention to the trends of the world industry, especially the Philippines.

According to JETRO in New York, the Department of Treasury lifted a ban on tuna imports and tuna products from Mexico which had been enforced since 1980. It is quite possible that Mexico will take part in the American market. Mexico provides its own tuna raw materials and produced about 1,700,000 cases in 1980, two million cases in 1985 which were for domestic consumption.

However, the tuna production of Mexico was estimated at about one hundred thousand (100,000) tons in 1986, and if its production is packed about 5,000,000 cases of canned tuna will be produced. This means that Mexico has reached a condition to export half of its production overseas after fulfilling its own demand.

As mentioned above, when Mexico expands its business to the U.S.A. tuna market, with production of 5,000,000 to 6,000,000 cases of canned tuna, Central and South America will probably rank next to Thailand with exports of 7,000,000 cases a year.

About 10 million cases of canned tuna are imported by the US per year. It is unavoidable that a boost by the Thai tuna canning industry will meet with strong resistance not only from the US industry, but also from other exporting countries of canned tuna.

As mentioned above, the Thai canned tuna industry has been driven into a jam. Therefore it is said that for the Thai industry to maintain its current position in the US market will be very difficult.

Currently the Thai tuna canning industry is the most competitive in both price and quality in the US market therefore, the Thai industry has rapidly grown and now holds the greatest share of the market.

If we separate the price of canned tuna into production cost and transportation cost, it is obvious that the countries closer to the market can have an absolute advantage over other countries.

The portion of the selling price represented by the freight charge of Thai canned tuna on the US market is estimated at about five per cent, and that of Central and South America at two to three per cent.

According to information from a business company, the cheapest canned tuna on the US market comes from Ecuador and Venezuela.

Since the labor costs of those Central and South American countries are the same as that of Thailand, or a little bit lower, they are powerful competitors with Thailand.

So far, although Thai canned tuna is superior to those from Central and South America in the respect of quality, it is threatened by the other two in respect of price and freight charge.

Therefore, the Thai tuna canning industry must make a great effort to reduce production costs and the other costs while maintaining the present quality of canned tuna and improving its competitiveness.

According to Mr. Mongkol who is a marketing manager of the UNICORD CO., LTD. which is one of the biggest canning companies leading the Thai canned tuna industry; the Thai tuna canning industry has already grown by introducing canning technology from many foreign countries and also developing original canning technology and devices.

Moreover, the industry has gained an immobile position among Thai industries and greatly contributed to the acquisition of foreign currency. Therefore, the industry cannot go back.

What steps should the Thai tuna canning industry take hereafter to survive in the market?

1. The Thai tuna canning industry has to make a great effort to keep their present share, especially of the US market.

2. The industry must promote their product to expand their share in the existing market, especially in Western Europe, Canada, Australia, Malaysia, the Middle East and Japan.

3. The industry should make an effort to seek new markets for their products. Japan is producing and consuming canned tuna ranking after the U.S.A. and Western Europe. It is inevitable that Japan be asked to open up their market to the canned tuna industry whether they like it or not. Furthermore, the industry must proceed with the development of canned tuna in Thailand. It should be possible to rouse Thai domestic demand for canned tuna if the industry can supply cheap canned tuna at less than 10 baht for a 200g can using cheaper local tuna production.

4. As tuna is an international commodity, its price often fluctuates depending on world market prices. Therefore, the industry must secure a stable supply of imported raw materials as well as domestic ones at a low price. This is one of the main factors of maintaining the present competitiveness of Thai canned tuna.

For a few years hereafter, the industry will be able to cope if it follows the measures mentioned above. However, they have to establish some organization to deal with tuna materials for the whole of the Thai tuna canning industry and to coexist with tuna producers such as the American Tuna Sellers Association (ATSA) by 1990.

The ideal is that demand and supply be well balanced. In other words a prosperous coexistence of tuna producers, the tuna canners and general consumers benefits each and all of them.

Nowadays the Thai industry utilizes over two hundred thousand (200,000) tons of tuna as material for their canned tuna products. This amount is equivalent to over 10 per cent of the world tuna production, which means that the issues which affect this industry also affect the world tuna fisheries activity seriously.

In the US ATSA was established by a group of owners of American tuna purse seiners. The purpose of ATSA is to sell their capture at the most profitable price.

Therefore, a Thai Tuna Buyers Association (TTBA) should be established by a group of Thai tuna canning companies by about 1990 to compete with ATSA.

The purpose of a TTBA would be to buy the necessary quantity of quality tuna needed for canned tuna products by its members.

5. The Thai canned tuna industry must make an effort to improve the quality and productivity of canned tuna by technological innovations and protect the industry from claims for damages due to poor quality products.

One way of controlling the quality of Thai canned tuna would be to establish a laboratory under the authority of the industry. The merits of this scheme are as follows:

- (1) standardization of the QC (quality control) of Thai canned tuna.
- (2) improvement of the products
- (3) reduction of the expence of product study and development by establishing a common laboratory.

6. A continued effort is required to maintain competitiveness and curtail expenses, not only of production costs but all costs of the Thai canned tuna industry.

7. In order to develop new products, it is advisable to study the markets in order to know the consumers preferences, for example:

- 1) presentation of contents of canned tuna
- 2) taste or flavor salty, spicy, sweet, etc.
- 3) labeling of canned tuna
- 4) size and shape of the can
- 5) one-touch-open-can
This can be opened without can opener.

Moreover, producers should know what canned tuna for which consumers.

Since the beginning of 1980, the Thai canned tuna industry has overwhelmed that of other countries in the US market, the biggest canned tuna market in the world. Since 1984, Thailand has been the greatest exporting country of canned tuna in the world, to maintain its position the Thai tuna industry has continued increasing its production and exports on a constant basis.

It was estimated that the TCTI exported twelve million (12,000,000) cases of canned tuna to the world market, including seven million cases to the U.S.A. in 1986.

The Thai tuna canning industry has already made a considerable sum of money from the export of canned tuna and gained its present unshakable position in the world canned tuna market. For example, twelve million cases is equivalent to two hundred and forty million US dollars (US \$240,000,000) when the price is twenty US dollars (US \$20) per case of canned tuna, or three hundred and twenty four million US dollars (US \$324,000,000) when a case costs twenty seven US dollars (US \$27).

Moreover the industry has won worldwide acknowledgement that Thai canned tuna is delicious, of good quality, cheap and safe.

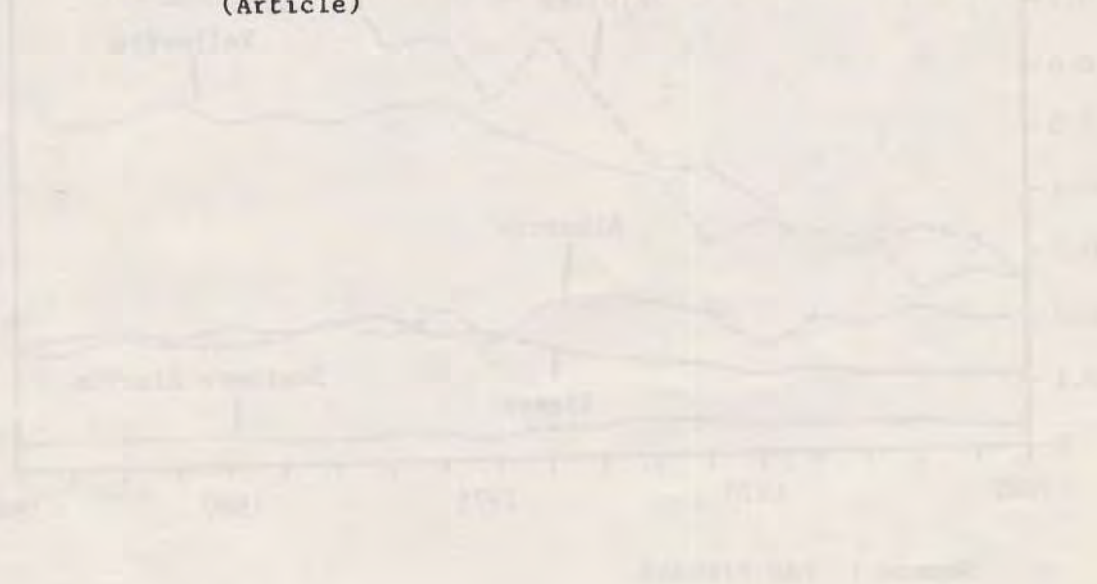
It is, however, unavoidable that the world canned tuna industry will be involved in an increasing price war (competition).

I would like to finish here with the hope that the Thai canned tuna industry will always be daring, full of vitality and will continue to make more increased efforts.

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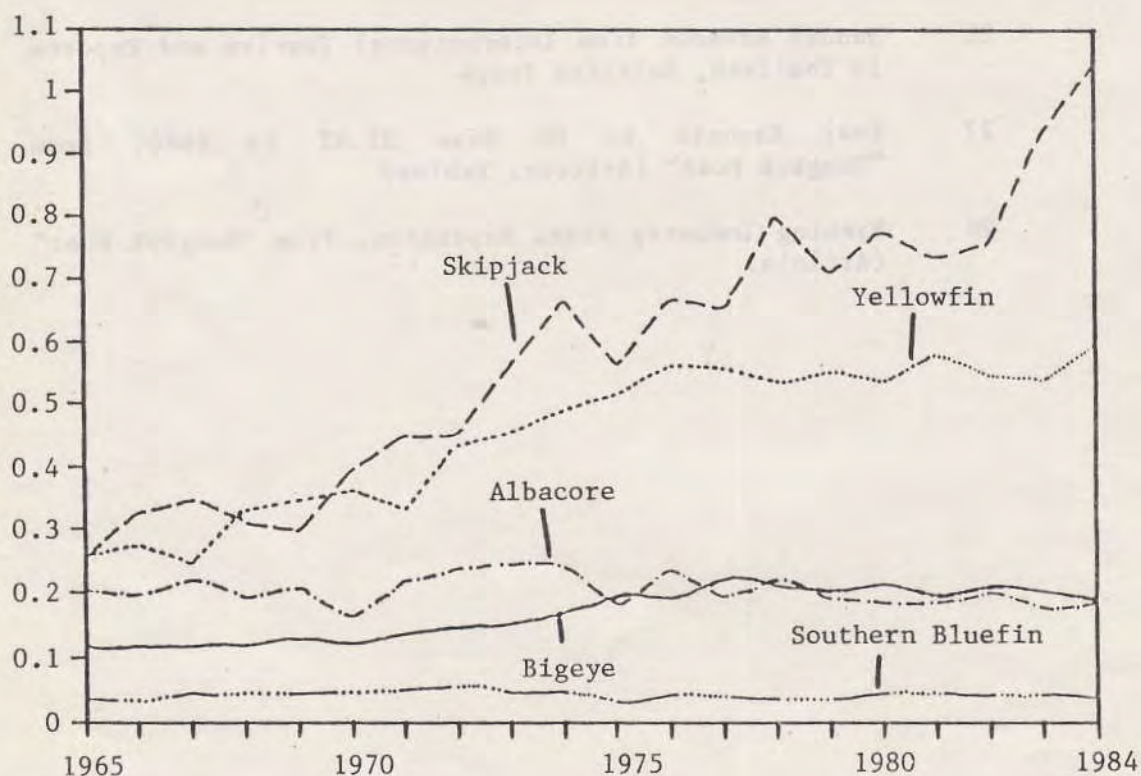


Appendix 1: World Tuna Production by Species, Selected Years
(1,000 metric tons)

	1970	1975	1979	1980	1981	1982	1983	1984
Skipjack	391	563	712	780	735	760	940	1050
Yellowfin	362	516	552	535	579	545	537	599
Albacore	159	182	192	185	189	204	178	186
Bigeye	121	196	201	216	194	211	202	190
Southern Bluefin	47	33	39	47	45	42	46	38
Northern Bluefin	37	39	38	33	45	49	43	35
TOTAL	1118	1530	1733	1796	1787	1811	1946	2099

Source : FAO FISHDAB.

Appendix 2: World Tuna Production by Species, 1965-1984
(Million MT)



Source : FAO FISHDAB.

Appendix 3: World Tuna^a production by Major Tuna-Fishing Nations,
Selected Years
(thousand metric tons, live weight)

	<u>1970</u>	<u>1975</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>
Japan	502	542	672	723	642	674	696	788
United States	214	259	218	226	222	199	266 ^b	263
Spain	47	77	100	101	122	131	126	132
Indonesia	21	39	61	73	84	90	103	115
Philippines	52	84	94	79	95	103	119	104
France	50	58	64	72	69	69	84	100
Taiwan	89	90	109	106	90	104	104	99
Mexico	11	23	31	34	68	45	38	78
Korea, Rep.	NA	119	125	110	105	108	89	71
Venezuela	2	1	3	4	6	4	39	53
Solomon Islands	0	7	24	23	26	20	34	36
Maldives	29	20	22	28	26	20	26	32
Ecuador	16	36	34	19	19	21	15	29
Ghana	0	8	6	9	15	29	33	22
Brazil	1	2	5	10	24	17	17	22
Panama	0	36	18	21	16	25	14	20
Sri Lanka	18	22	14	20	21	22	23	18
Australia	8	11	11	14	18	21	22	16
Others	58	96	122	124	119	109	98	101
TOTAL	1118	1530	1733	1796	1787	1811	1946	2099

Source : FAO FISHDAB.

^a Including albacore, yellowfin, skipjack, bigeye and bluefin tuna only.

^b Revised figure.

NA Indicates not available.

Appendix 4 : Tuna Production by FAO Statistical Fishing Area, Selected Years.

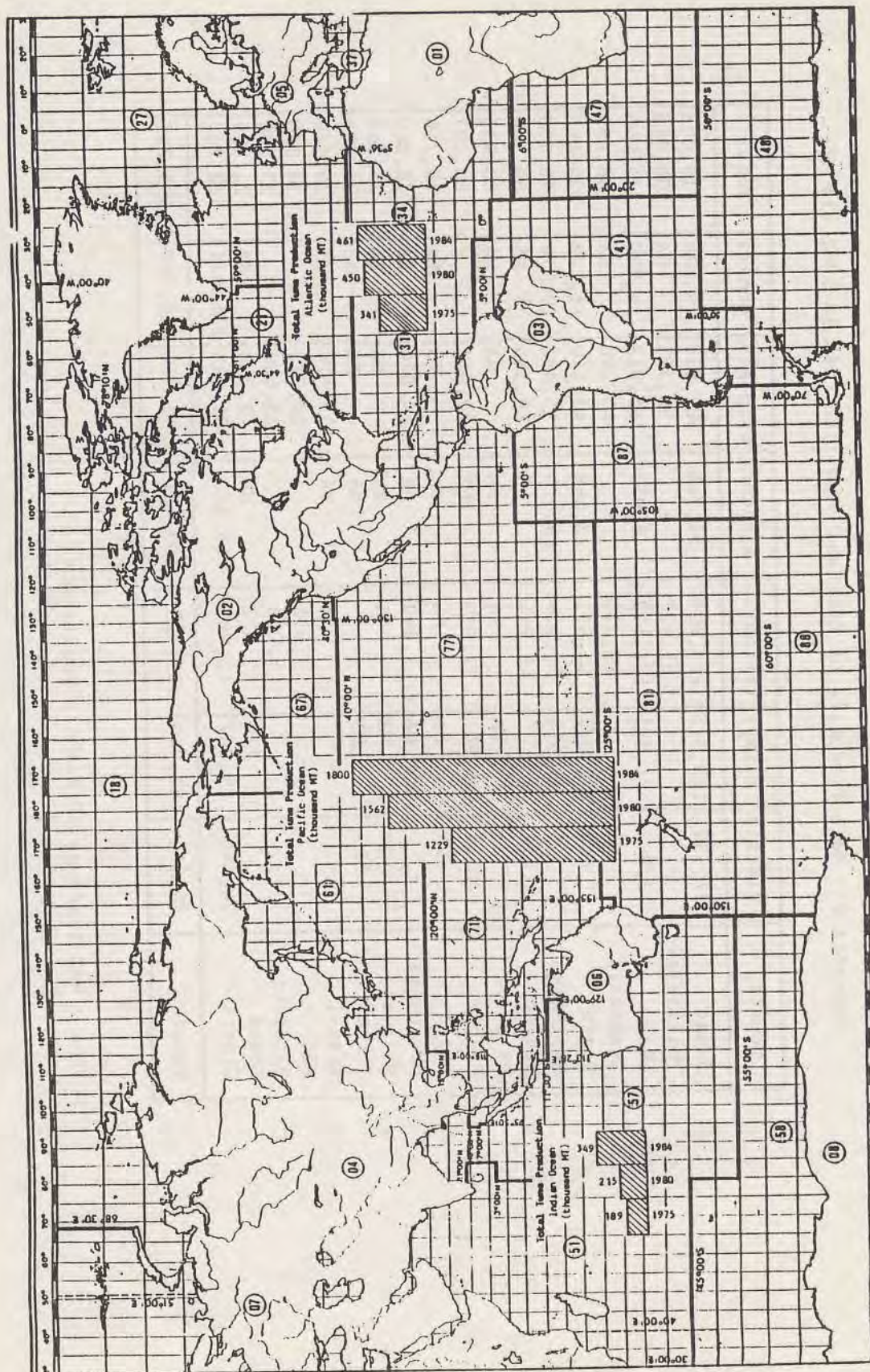
	1970	1975	1979	1980	1981	1982	1983 ^b	1984
	(metric tons)							
Fishing Area 21: Northwest Atlantic	5,400	6,384	8,364	10,822	13,966	16,142	22,083	17,021
Fishing Area 27: Northeast Atlantic	38,300	38,306	46,076	40,804	33,241	44,338	48,455	34,117
Fishing Area 31: Western Central Atlantic	18,100	24,762	26,341	28,499	35,772	44,622	63,755	88,534
Fishing Area 34: Eastern Central Atlantic	126,600	223,584	230,143	275,191	293,410	315,939	283,164	244,631
Fishing Area 37: Mediterranean/Black Sea	10,200	11,986	9,678	9,938	11,828	19,489	17,963	20,399
Fishing Area 41: Southwest Atlantic	19,400	9,205	14,124	18,247	35,992	26,885	22,925	30,299
Fishing Area 47: Southeast Atlantic	24,900	27,483	56,247	42,474	41,413	48,633	31,812	34,872
Sub-Total: Atlantic Ocean	242,900	341,710	390,973	416,975	465,622	516,048	489,527	449,873
Fishing Area 51: Western Indian Ocean	117,500	126,697	118,484	120,961	133,825	164,308	192,736	233,653
Fishing Area 57: Eastern Indian Ocean	39,800	62,355	73,495	94,712	77,521	99,474	116,294	115,818
Sub-Total: Indian Ocean	157,300	189,052	191,979	215,673	211,346	263,782	309,030	349,471
Fishing Area 61: Northwest Pacific	296,100	279,709	357,580	366,156	278,156	301,625	310,907	416,198
Fishing Area 67: Northeast Pacific	17,700	19,281	4,760	2,907	6,448	2,396	3,598	3,590
Fishing Area 71: Western Central Pacific	257,900	489,826	652,535	706,707	744,923	777,242	989,107	1,004,110
Fishing Area 77: Eastern Central Pacific	277,710	385,877	432,991	397,405	419,382	373,314	274,930	334,250
Fishing Area 81: Southwest Pacific	31,700	53,651	45,978	61,718	56,680	45,020	25,619	20,673
Fishing Area 87: Southeast Pacific	25,300	1,131	16,694	27,510	24,323	15,151	20,154	21,549
Sub-Total: Pacific Ocean	906,410	1,229,475	1,510,538	1,562,403	1,529,912	1,514,748	1,624,315	1,800,370

Source : FAO FISHDAB.

^a Including tuna and tuna-like species.

^b Revised figures.

Appendix 5: Major Fishing Areas for Statistical Purposes



Appendix 6 : Main Producers of Tuna and Tuna-like Fish in 1982 (in MT)

Country	Bluefin	Bigeye	Yellowfin	Albacore	Skipjack	Others	Total
Japan	37,733	120,915	111,605	66,744	302,978	79,828	719,803
Philippines	-	-	51,922	-	50,795	NA	239,688
USA	2,947	1,585	101,549	6,953	85,912	15,200	214,046
Indonesia	NA	-	19,530	-	47,140	NA	186,690
Spain	1,640	2,600	54,833	22,468	41,170	11,779	134,490
Rep Korea	6	39,614	36,136	16,914	15,081	18,976	126,730
Mexico	1,852	-	46,964	5	18,345	NA	89,142
PR China	NA	NA	NA	NA	NA	NA	60,935
France	519	1,901	32,010	708	25,062	7	60,207
India	NA	NA	NA	NA	NA	NA	46,756
Sri Lanka	-	NA	7,840	NA	14,070	NA	38,240
Malaysia	NA	NA	NA	NA	NA	NA	33,360
Turkey	825	NA	-	NA	NA	NA	31,843
Brazil	-	-	NA	NA	15,670	NA	30,020
PNG	-	-	3,516	-	20,513	-	24,029
Maldives	-	-	4,000	-	15,600	-	23,600
Ghana	-	118	2,872	NA	8,040	NA	21,395
Others	24,848	16,207	62,948	69,689	101,935	236,611	512,233
Total	70,370	182,940	535,725	183,481	762,314	358,382	2,593,212

Source : FAO Yearbook of Fishery Statistics

Appendix 7: Exports of Fresh and Frozen Tuna by Major Exporting Nations, 1979-1984
(thousand metric tons)

	1979	1980	1981	1982	1983	1984
Japan	59	91	46	41	56	89
Korea Rep.	152	118	107	81	188	86
France	14	17	23	37	46	37
Solomon Islands	23	22	24	15	28	33
Mexico ^a	NA	NA	22	15	12	32
Singapore	11	22	24	19	28	29
Spain	27	21	45	53	45	26
Philippines ^a	35	49	36	18	19	14
Ghana	38	28	32	31	21	16
Indonesia	10	11	14	19	20	15
Maldives	13	14	14	10	8	14
Taiwan	-	-	11	12	12	13
Venezuela	5	4	9	9	9	8
Brazil	-	-	-	16	15	6
Ecuador	-	-	6	5	8	6
Ivory Coast	-	2	1	2	3	3
Australia	2	6	4	10	12	5
New Zealand	9	9	9	4	7	5
Vanuatu	8	8	5	4	5	4
Uruguay	-	-	-	1	2	4
Chile	-	2	1	2	3	3
P N Guinea	27	33	30	3	1	2
Italy	1	1	2	1	2	1
China, PR	-	-	-	2	1	1
Cayman Islands	-	-	2	10	4	-
Others	15	12	32	13	NA	NA
TOTAL	449	470	499	433	555 ^b	452 ^b

Source : FAO FISHDAB.

^a Estimate.

^b Including only those countries listed.

- Indicates less than 500 metric tons.

NA Indicates not available.

Appendix 8: Imports of Fresh and Frozen Tuna by Major Importing Nations, 1979-1984
(thousand metric tons)

	1979	1980	1981	1982	1983	1984
United States	286	269	274	222	199	183
Japan	112	92	101	127	142	111
Thailand ^a	NA	NA	NA	NA	26	110
Italy	75	77	71	77	74	83
Ivory Coast	8	14	15	25	28	26
Singapore	7	14	15	9	18	20
France	11	11	12	20	19	19
Senegal	12	14	20	14	23	16
Spain	8	12	28	43	22	15
Ghana	39	28	27	17	20	15
Canada	9	14	11	15	13	11
Others	19	18	19	18	23	NA
TOTAL	586	563	593	587	575 ^b	618 ^b

Source : FAO FISHDAB.

^a Estimate.

^b Including only those countries listed.

NA Indicates not available.

Appendix 9 : Total Frozen Tuna Supplies by Selected Countries, 1981-1985
(Thousand metric tons)

	1981	1982	1983	1984	1985 ⁿ
JAPAN					
Landings	470	378	498	542	500
Imports	101	127	142	111	148
Exports	36	40	44	74	40
Supply	535	465	596	579	608
UNITED STATES					
Landings	222	199	266	263	217
Imports ^b	274	222	199	183	173
Exports	-	-	-	-	-
Supply	496	421	465	446	390
THAILAND					
Landings	(22)	(49)	(51)	(50)	(50)
Imports	-	-	(26)	(110)	(180)
Exports	-	-	-	-	-
Supply	(22)	(49)	(77)	(160)	(230)
SPAIN					
Landings	122	131	126	132	140
Imports	28	43	22	15	11
Exports	45	53	45	26	32
Supply	105	121	103	121	119
INDONESIA					
Landings	84	90	103	115	130
Imports	-	-	-	-	-
Exports ^c	14	19	20	15	22
Supply	NA	NA	NA	NA	NA
PHILIPPINES					
Landings	95	103	119	104	106
Imports	3	2	-	2	-
Exports	36	18	19	14	12
Supply	62	87	100	92	94
ITALY					
Landings	1	2	2	2	2
Imports	71	77	74	83	90
Exports	2	1	2	1	2
Supply	70	78	74	84	90
FRANCE					
Landings	69	69	84	100	110
Imports	12	20	19	19	20
Exports	23	37	46	37	52
Supply	58	52	57	82	78
MEXICO					
Landings	68	45	38	78	93
Imports	-	-	-	-	-
Exports	(22)	(15)	(12)	(32)	(58)
Supply	(46)	(30)	(26)	(46)	(35)
TAIWAN					
Landings	90	104	104	99	NA
Imports	-	-	-	-	NA
Exports ^d	11	12	12	13	NA
Supply	NA	NA	NA	NA	NA
KOREA, REP					
Landings	105	108	89	71	NA
Imports	-	-	-	-	NA
Exports ^e	107	81	188	86	NA
Supply	NA	NA	NA	NA	NA
IVORY COAST					
Landing	17	18	15	3	5
Imports	15	25	28	26	24
Exports	-	-	-	-	-
Supply	32	43	43	29	29

Source : GLOBEFISH

a/ Preliminary data.

b/ Frozen tuna landings and imports to American Samoa are included in domestic landings and not in U.S. imports.

c/ Indonesia's exports are probably larger than the figures reported here.

d/ Taiwan's exports are substantially larger than those reported here because these figures do not include direct overseas sales.

e/ Korea's exports include direct sales of fishing vessels operating overseas.

- Indicates less than 500 metric tons.

NA Indicates estimate from best available data.

() Indicates estimate from best available data.

Total may not add due to rounding.

Appendix 10 : Exports of Canned Tuna by Major Exporting Nations,
1979-1984
(thousand metric tons)

	1979	1980	1981	1982	1983	1984
Thailand ^a	-	-	8	15	28	59
Japan	38	38	35	36	37	46
Philippines	4	11	18	19	24	23
Ivory Coast	14	18	17	19	24	23
Senegal	12	12	15	16	20	20
Taiwan	-	-	14	11	15	13
Spain	7	8	12	2	4	4
Others	16	18	20	21	23	19
TOTAL	91	105	139	139	175	207

Source : FAO FISHDAB.

^a Estimate.

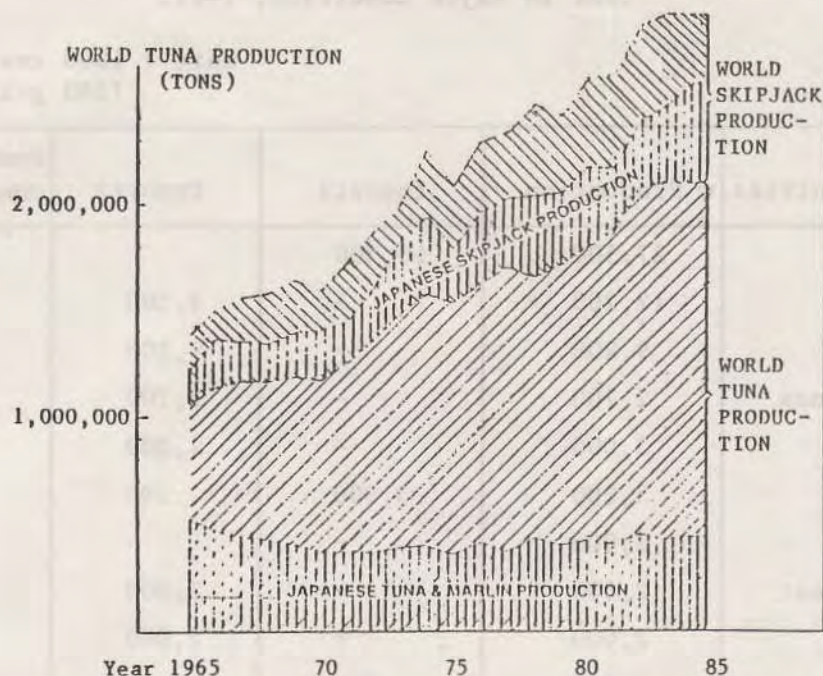
- Indicates less than 500 metric tons.

Appendix 11 : Imports of Canned Tuna by Major Importing Nations,
1979-1984
(thousand metric tons)

	1979	1980	1981	1982	1983	1984
United States	24	29	32	40	55	74
France	23	25	28	30	34	33
United Kingdom	10	11	19	13	18	24
Germany, FR	15	15	14	15	16	19
Canada	10	9	10	7	11	12
Sweden	3	3	3	3	3	4
Italy	3	3	2	3	3	4
Australia	2	3	2	1	1	3
Belgium	4	4	5	4	5	2
Denmark	1	1	1	1	2	2
Netherlands	1	2	1	1	1	2
Others	15	11	8	9	8	5
TOTAL	111	116	125	127	157	184

Source : FAO FISHDAB

Appendix 12 : World Tuna and Skipjack Production, 1965-1985



Source : Infofish (Tuna Trade Conference)

Appendix 13 : Canned Tuna Production by Major Producing Nations, 1979-1984

(thousand metric tons, product weight)

	1979	1980	1981	1982	1983	1984
United States	283	275	287	246	268	275
Japan	95	95	111	113	117	124
Italy	43	48	49	48	52	59
Thailand ^a	-	-	8	15	28	59
France	27	25	23	30	35	38
Spain	41	43	40	37	32	30
Ivory Coast	14	18	26	29	26	23
Philippines ^a	4	11	18	19	24	23
Mexico	15	15	20	13	11	22
Taiwan	-	-	14	11	15	13
Ecuador	5	5	12	11	7	12
Others	27	53	70	65	74	99
TOTAL	554	588	678	637	690	777

Source : FAO FISHDAB.

^a Estimate.

- Indicates less than 500 metric tons.

Appendix 14 : Estimated Production and Consumption of Canned Tuna in Major Countries, 1985.

unit : 1000 cases of
(200 g x 48 pcs)

Major countries	Production	Imports	Exports	Domestic consumption
U.S.A.	27,500	10,300	-	37,800
Japan	12,200	-	3,500	8,700
Thailand	9,200	-	9,200	-
Philippines	2,700	-	2,700	-
Taiwan	3,000	-	2,000	1,000
France	3,200	3,900	300	6,800
Mexico	2,000	-	-	2,000
Ivory Coast	2,600	-	2,600	-
Senegal	2,000	-	2,000	-
Australia	1,000	300	-	1,300
Canada	500	1,200	-	1,700
U.K.	-	2,500	-	2,500
West Germany	-	2,100	-	2,100
Switzerland	-	500	-	500
South Africa	-	200	-	200
Italy	5,000	400	200	5,200
Spain	4,200	-	200	4,000
Belgium/ Luxembourg	-	600	-	600
Others	2,000	2,600	1,900	2,700
Total	77,100	24,600	24,600	77,100

Source : Japan Canned Tuna Exporting Fisheries Cooperative.

Appendix 15 : Exports and Imports of Canned Tuna by Major Countries, 1985 (Table)

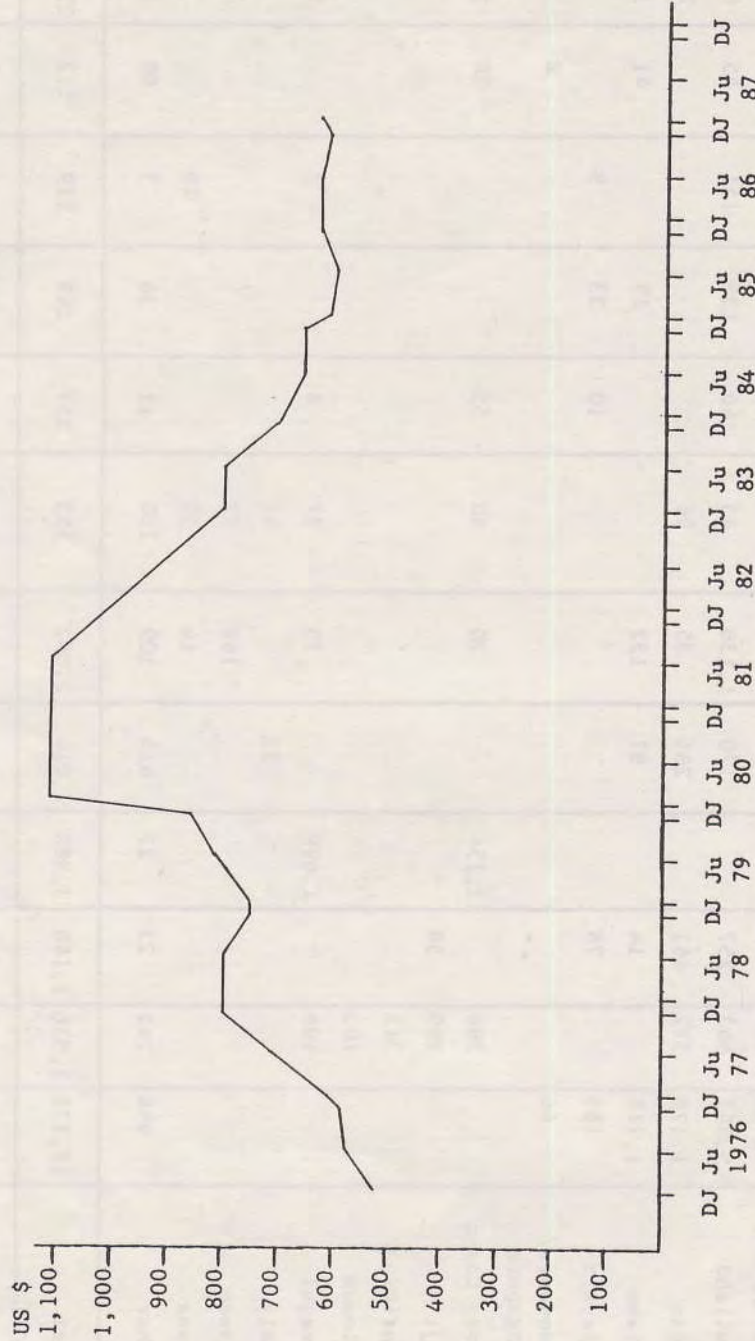
unit : 1000 cases of (200g x 48 tins)

Importing Export countries	USA	UK	Canada	France	Switzld	Fr. Germ	Belgim/ Luxemburg	Sweden	Denmark	Finland	Nethlds	Total
Philippines	1,466	300	257		24	399		2	42	15		2,505
Thailand	5,841	463	257		170	1,136	43	140	139	151	45	8,385
Japan	1,128	372	461		285	35	26					2,307
Taiwan	1,118		14		87	132			19		41	1,411
Malaysia	185		78					10	33	9		315
Indonesia/ Singapore	66										8	74
Ivory Coast		366		2,154		20	50	55			28	2,673
Fuji		260	58									318
Mauritius		312										312
Solomon		103										103
Senegal		106		1,699		73	27	8				1,913
Italy					33		67					100
France						169	77					246
Ghana						14	53			19		86
Other	468	242	23	27	415	109	210	12	36	5	90	1,637
Total	10,272	2,530	1,148	3,880	1,014	2,087	553	237	269	119	212	22,395
1984	7,716	2,530	1,207	3,421	1,006	2,011	523	287	229	147	228	19,305

Note : Figures for Switzerland include Sardines in oil, Anchovies, and Mackerel.

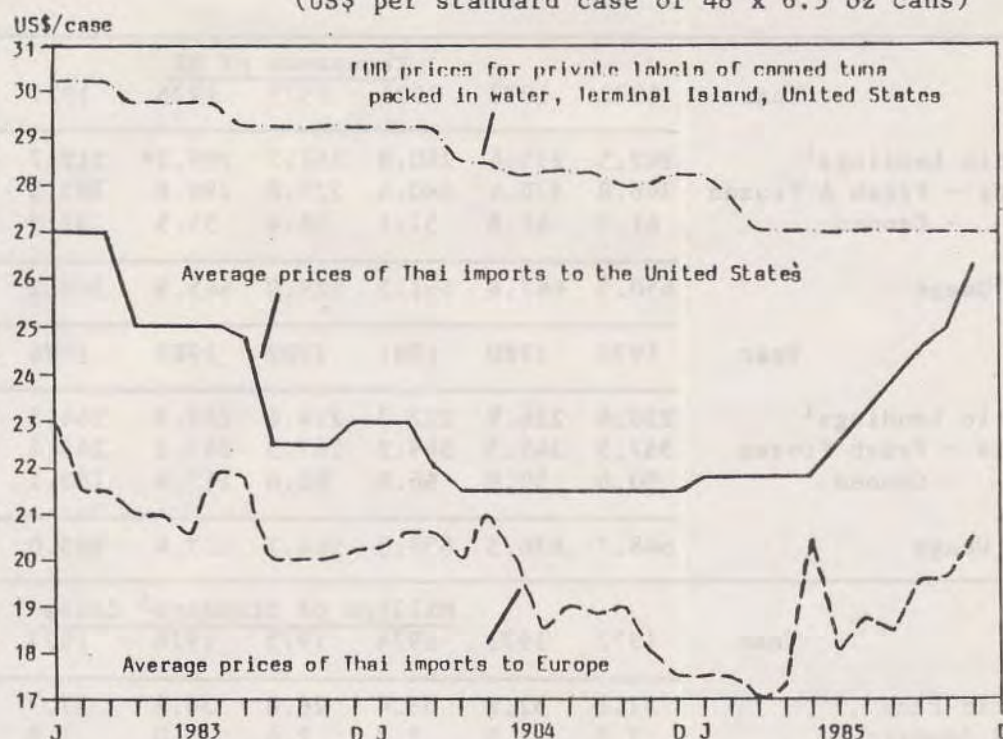
Source : FAO FISHDAB

Appendix 16 : Change of ATSA Price, Skipjack. 4 lbs per S/T.



Source : ATSA (American Tuna Sellers Association)

Appendix 17: Canned Lightmeat Tuna Prices, 1983-1985
(US\$ per standard case of 48 x 6.5 oz cans)



Appendix 18: United States Imports of Canned Tuna by
Country of Origin (MT-Product Weight)

Country	1983	1984	1985
Australia	1,272	-	-
Ecuador	-	152	2,126
Indonesia	1,197	1,010	631
Japan	9,267	12,207	10,774
Malaysia	1,401	731	1,763
Philippines	14,554	10,102	12,999
Singapore	150	29	33
Spain	60	97	152
Taiwan	8,505	8,152	10,669
Thailand	18,150	40,766	55,757
Other	948	400	1,345
Total	55,054	73,246	97,249

Source : Infofish (Tuna Trade Conference)

Appendix 19: U.S.A. Tuna Market, 1972-1985

Year	Thousands of MT					1977	1978
	1972	1973	1974	1975	1976		
Domestic Landings ¹	242.5	235.4	250.0	257.7	299.2*	212.7	256.7
Imports - Fresh & Frozen	346.8	370.4	380.4	220.8	290.8	303.8	394.8*
- Canned	61.2	41.8	57.1	51.4	55.5	32.7	48.8
Total Usage	650.5	647.6	667.5	529.9	645.5	549.2	700.3*
Year	1979	1980	1981	1982	1983	1984	1985 ²
	1979	1980	1981	1982	1983	1984	1985 ²
Domestic Landings ¹	230.6	226.9	222.3	214.6	265.9	264.5	210.0
Imports - Fresh Frozen	367.5	349.5	349.2	267.5	242.1	245.4	233.7
- Canned	50.6	59.9	66.8	82.6	115.4	153.1	200.7*
Total Usage	648.7	636.3	638.3	564.7	623.4	663.0	644.4
Year	Million of Standard ³ Cases					1977	1978
	1972	1973	1974	1975	1976		
Domestic Pack	31.1	32.2	33.4	26.8	30.3	27.7	35.6*
Canned Imports	2.7	1.8	2.7	2.6	3.0	1.8	2.7
Total Canned	33.8	34.0	36.1	29.4	33.3	29.5	38.3
Per-Capita Consumption ⁴ (in kg)	3.14	3.04	3.32*	2.51	3.05	2.54	3.16
Year	1979	1980	1981	1982	1983	1984	1985 ²
	1979	1980	1981	1982	1983	1984	1985 ²
Domestic Pack	31.4	30.5	31.8	27.1	29.9	31.0	27.4
Canned Imports	2.7	3.3	3.6	4.5	6.3	8.3	10.9*
Total Canned	34.1	33.8	35.4	31.6	36.2	39.3*	38.3*
Per-Capita Consumption ⁴ (in kg)	2.89	2.80	2.79	2.38	2.84	2.76	2.71

¹ All tuna species

² Preliminary

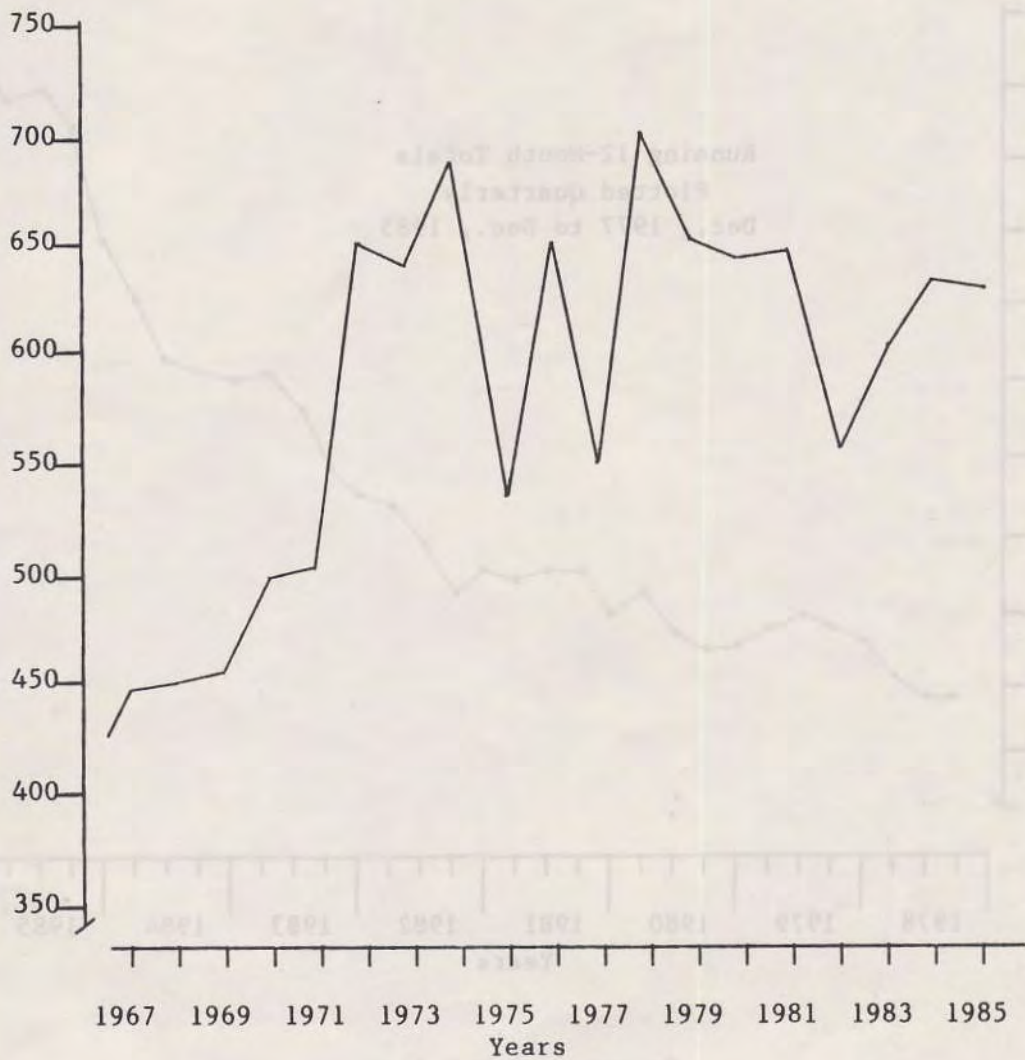
³ 48 x 6.5 oz cans per case

⁴ Based on total tuna supplies

* Record year

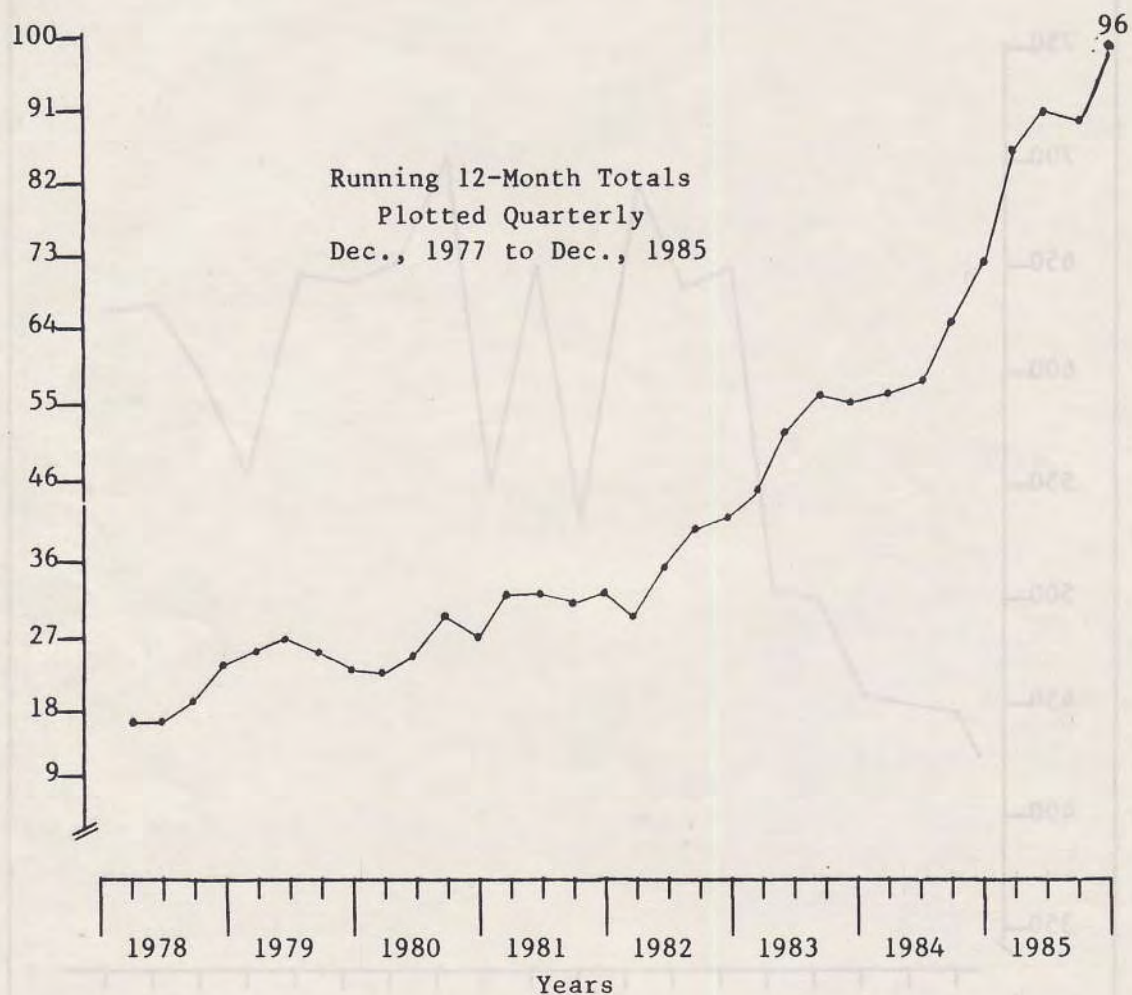
Source : Infofish (Tuna Trade Conference)

Appendix 20 : United States Annual Tuna Usage
(Metric Tons x 1000/Round Weight Basis)



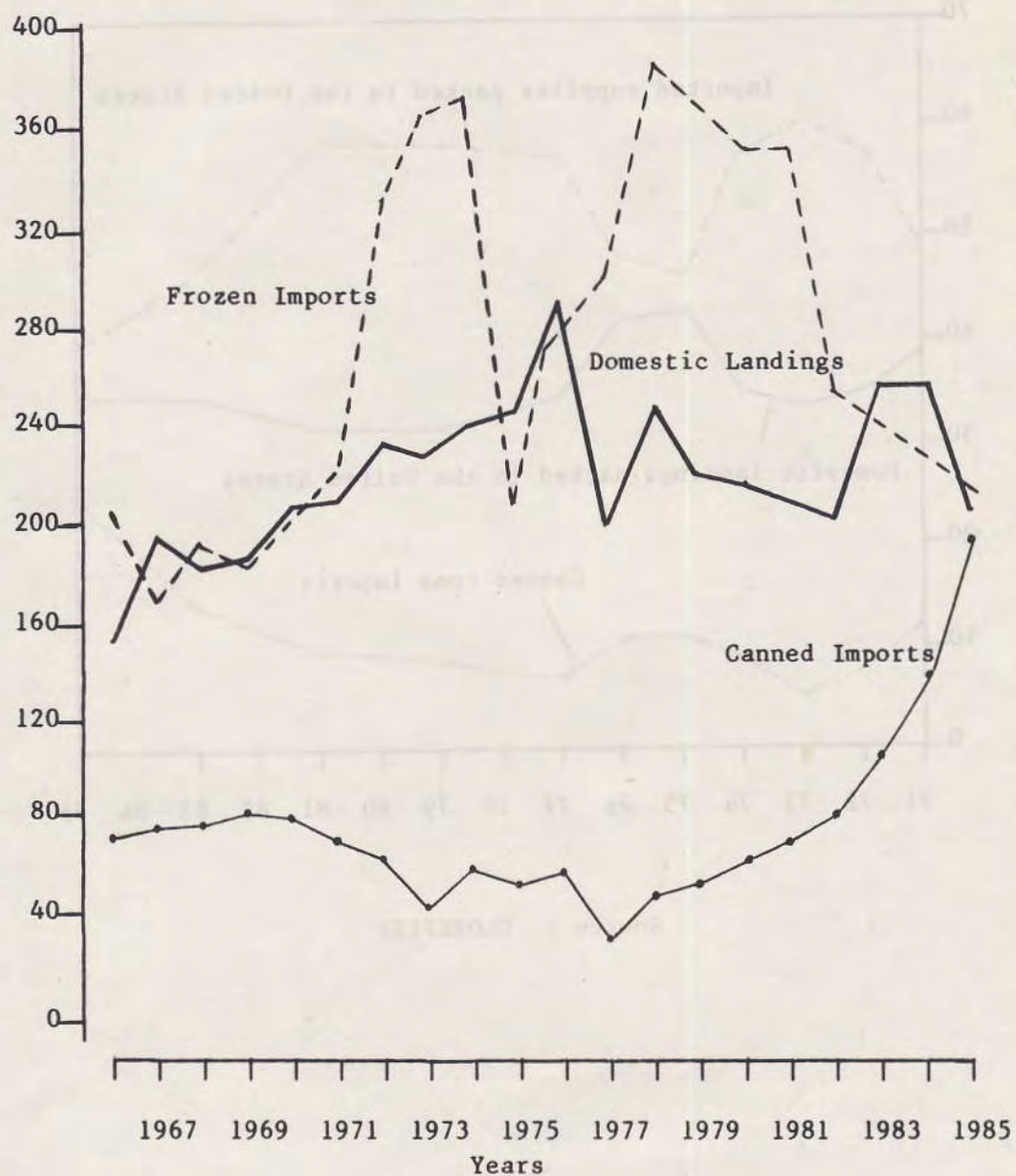
Source : L M R Inc.

Appendix 21 : United States Canned Tuna Imports
(Metric Tons x 1000/Product Weight Basis)



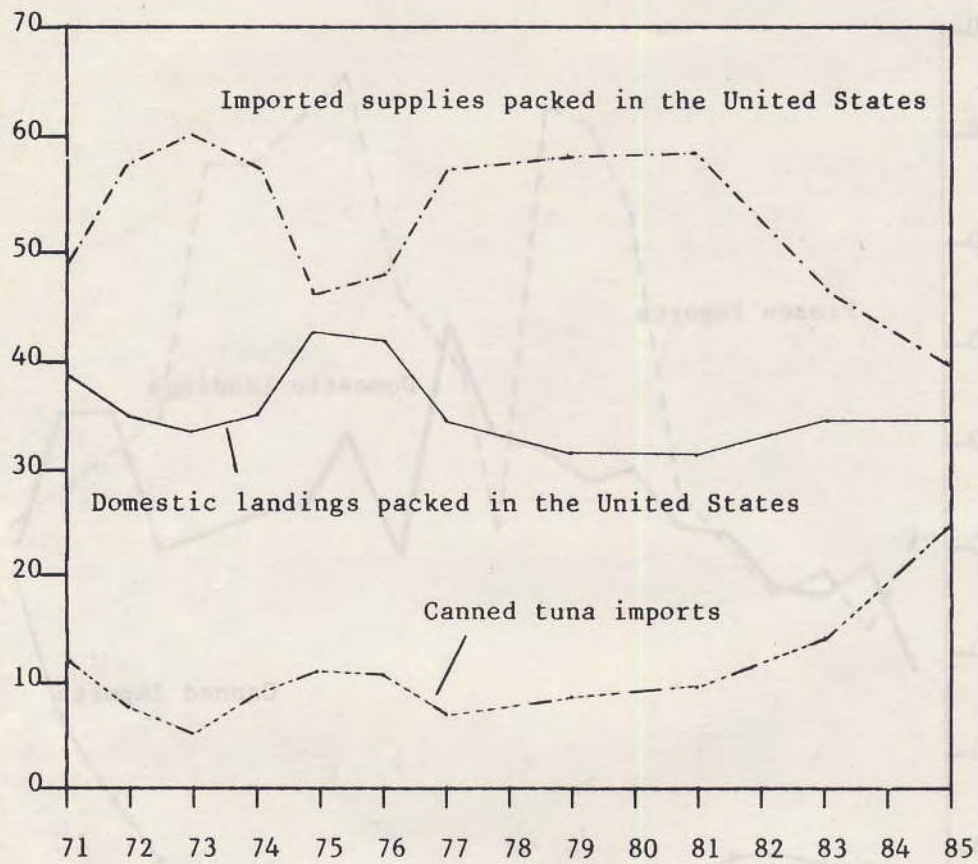
Source : L M R Inc.

Appendix 22 : United States Tuna Receipts
(Metric Tons x 1000/Round Weight Basis)



Source : Living Marine Resources, Incorporated,
California (LMR Inc.)

Appendix 23: Components of US Canned Tuna Supplies, 1971-1985.
(per cent of total supply)



Source : GLOBEFISH

Appendix 24: Estimated Production of Canned Tuna in U.S.A.
(Table)

Unit : 1000 cases of
(200 g x 48 tons)

		Period (Jan.-June/1986)	Same period of last year (1985)	Increasing rate to amount of last same period in 1985 (%)
Departure of U.S.A.	Mainland, Hawaii, American Samoa	Canned tuna of		
		White meat 606	444	36
		Light meat 3,886	3,249	20
		Total 4,492	3,693	22
	Puerto Rico	White meat 2,406	1,708	41
		Light meat 6,167	5,768	07
		Total 8,573	7,476	15
	Total	White meat 3,012	2,152	40
		Light meat 10,053	9,017	12
		Total 13,065	11,169	17

Source : Ministry of Commerce, U.S.A.

Appendix 25: U.S.A. Imports of canned Tuna During January to June 1986

R A N K	Departure	White meat canned tuna	Light meat canned tuna	Total volume	Total volume of last same period in 1985	Increasing rate to the last same period in 1985
1.	Thailand	67	2,346	4,480	3,405	32 %
2.	Taiwan	148	289	805	538	50 %
3.	Philippines	9	439	768	768	0 %
4.	Japan	177	37	342	813	-58 %
5.	Venezuela	3	99	208	-	-
6.	Ecuador	-	62	101	158	-36 %
7.	Malaysia	31	18	74	114	-35 %
8.	S. Korea	-	32	50	3	16 times
9.	Singapore	-	19	45	9	4 times
10.	Indonesia	-	11	23	35	-34 %
11.	Others	1	8	28	34	-18 %
Total		436	3,360	6,924	5,877	18 %
Thailand/Total = Share of Thailand in US. Importing market		15 %	70 %	65 %	60 %	

Source : Ministry of Commerce, U.S.A.

Appendix 26: Annual Revenue from International Tourism and Exports
in Thailand, Selected Years.

unit : One million baht

No.	Item	1964	1980	1981	1982	1983	1984
1.	Rice	4,461	19,562	26,367	22,504	20,157	25,932
2.	Rubber	2,060	12,399	10,840	9,490	11,787	13,004
3.	Maize (corn)	1,361	7,192	8,349	8,330	8,486	10,147
4.	Tin	961	11,347	9,091	7,773	-	-
5.	Tapioca	666	14,836	16,446	19,869	15,387	16,660
6.	Jute	496	-	-	-	-	-
7.	Tourism	430	17,765	21,455	23,879	25,050	27,317
8.	Teak	178	-	-	-	-	-
9.	Transistor	-	6,193	6,221	5,930	5,829	7,352
10.	Kapok	124	-	-	-	-	-
11.	Textile	-	4,755	12,531	14,049	14,351	19,155
12.	Sugar	-	-	9,571	12,933	6,338	-
13.	Jewelry	-	3,775	-	-	6,214	6,129
14.	Canned fish	-	-	-	-	-	5,858

Source : Ministry of Commerce, Thailand.

Appendix 27: Bangkok Post, Thursday March 26, 1987.

Thai exports to US rise 21.4% in '86

THAI exports to the United States increased by 21.4% last year to US\$1.87 billion with the most improved export items being jewellery and coffee.

US imports to Thailand also increased, up by 15.7% to \$854.5 million giving Thailand a favourable balance of trade of \$1.02 billion. The total bilateral trade in civilian goods exceeded \$2.7 billion.

Exports of Thai jewellery continued to improve and registered a significant 142% increase to almost \$137 million. In only two years, Thai jewellery exports to the US have increased four-fold.

Coffee exports in-

creased a whopping 204% to \$51.4 million due partially to the temporary removal of restrictions on the volume of coffee exports under the International Coffee Agreement (ICA) and high prices caused by the Brazilian crop failure.

ICA controls on exports are expected to be reimposed this year so observers are waiting and watching to see whether Thailand will be able to maintain its coffee export performance in 1987.

Another major export is artificial fruit and flowers. The value of these products reached \$11.2 million, an increase of almost 70% over the 1985 level and fivefold

the 1984 level.

Rice exports to the US also continued to grow last year and earned Thailand \$23.6 million, bringing the US into Thailand's top 10 export customers by value. The US buys Thailand's highest quality rice and, last year, the unit price was almost double the average paid by Thailand's other rice markets.

Major imports of US goods comprised a 37% increase in machinery in 1986 to \$476.6 million. Last year's increase reversed several years of declining machinery imports.

Thailand's importation of US aircraft and parts also increased over the previous year.

Thai Exports to the US (Selected Categories)

	1984	1985	1986	% Chng 86/85
Apparel	250.2	285.0	242.6	-14.9
Integrated circuits	230.0	143.3	187.2	+30.6
Canned tuna	93.0	119.2	149.3	+25.3
Jewellery	34.2	56.6	136.9	+141.9
Gems & gemstones	92.6	71.2	109.1	+53.2
Textiles mill products (other than apparel)	64.0	68.0	79.6	+17.1
Canned pineapple	47.0	51.7	64.0	+23.8
Coffee	13.8	16.9	51.4	+204.1
Rubber	42.7	55.8	47.2	-15.4
Rice	10.1	17.6	23.6	+34.1
Tobacco	14.6	15.6	18.5	+18.6
Tin	106.5	81.2	14.7	-81.9
Pineapple juice	6.9	10.1	14.3	+41.6
Fish (chilled, frozen)	5.5	6.9	13.6	+97.1
Artificial flowers	2.3	6.6	11.2	+69.7
Sugar	16.8	12.4	8.9	-28.2

US Exports to Thailand (Selected Categories)

	1984	1985	1986	% Chng 86/85
Machinery and parts (including motor vehicles)	557.9	349.0	476.6	+36.6
Chemicals	119.3	103.8	110.8	+6.7
Aircraft and spacecraft	144.5	30.4	49.8	+63.8
Office machines	34.3	37.0	39.8	+7.6
Tobacco	41.3	47.6	30.6	-35.7
Fertilisers	37.9	26.8	28.2	+6.0
Cotton *	75.7	34.5	14.1	-59.1
Wheat	15.0	12.6	12.1	-4.0
Medical instruments	10.9	12.0	10.6	-11.7

UNIT: Million dollars.

* — The value of US cotton exports to Thailand was affected by a US programme which sharply lowered the price of cotton from last year's levels.

Appendix 28: Bangkok Post, 16 January 1985

Fishing industry plans expansion

THE fishing industry plans to set up a fleet to harvest international waters to supply local canneries.

Fisheries Department deputy chief Plodprasop Suraswadi said yesterday the fleet, which would comprise large trawlers and a cold-store vessel, would cost 8,000-4,000 million baht.

Canneries, fishermen and agencies concerned have approved the proposal in principle and they will be looking at the investment aspect soon.

The department will further discuss the issue with fishermen and canneries, and the Government might be asked to carry out a feasibility study on the use of international waters.

Dr Plodprasop said the fleet was planned to be a Thai venture but a joint venture with Japan,

Korea or the United States is also being considered.

Thailand's previous position as one of the world's leading fishing nations has been hit by the imposition of marine economic zones, oil price rises, static catch prices and depleting resources in the Gulf of Thailand.

CATCH

Last year's catch rose to about two million tons but the department said about 50 trawlers of about 100 tons unloaded in foreign ports.

The proposal aims at tuna fish. Last year, Thailand exported canned tuna worth about 3,000 million baht to the United States, which represented 40 per cent of US needs.

At the same time,

Thailand imported more than 100,000 tons of raw tuna for three factories, which are dependent on foreign supplies.

Dr Plodprasop said it was vital to set up enough canneries to compete with Indonesia and Malaysia and to develop a fleet to reduce the dependence on imports.

Thailand imports tuna from Indonesia, the Philippines, Japan and Pacific countries. Canned tuna exports are expected to increase by 15-20 per cent this year, he said.

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