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(2) ANDAMAN SEA COAST OF THAILAND

**STATUS OF PELAGIC FISHERIES ALONG THE  
ANDAMAN SEA COAST OF THAILAND**

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# STATUS OF PELAGIC FISHERIES ALONG THE ANDAMAN SEA COAST OF THAILAND

## Introduction

According to the development of marine fisheries in the past two decades, Thailand is currently ranked among the top-ten fishing nations in the world. Marine fishery production are shared about 87% of the total fishery productions, which consist of 82% from the Gulf of Thailand and 18% from the Andaman Sea Coast. Due to the rapid development of marine fisheries and also the limitation of fishing area, the fishery resources have been heavily exploited especially demersal fish and crustacean as a consequence of the catch has already over its maximum sustainable yield. In the same time, the pelagic fishes shared in the catch of all marine species increase from the range of 24 – 28% during 1979 – 1982 to 38 – 40% during 1988 – 1991, especially in the Andaman Sea area of Thailand, the pelagic fish production increased from 11,278 tons in 1980 to 176,794 tons in 1991.

From those reasons as discuss earlier, and the developing of pelagic fishing technique as well as expanding fishing area to off shore in the Andaman Sea lead pelagic fishery in the Andaman Sea play more important role of Thailand's marine fisheries.

## Pelagic Fisheries

The major type of fishing gears are purse seines, which accounting for approximately 85% of total pelagic catch by all gears during 1983 – 1991. The first purse seiner, Chinese purse seine (CPS) was introduced in 1930 and targeting on schoolfish such as Indian mackerel. The mesh size which currently used in CPS seine is 2.5 cm. while length and depth of the seine are within 300 – 450 m. and 50 – 80 m. respectively.

After the end of the Second World War, many CPS has been modified into Thai purse seine (TPS) using mesh size of 2.5 cm. which operated by using one main boat to set the net instead of setting net by 2 row boats as being used in CPS. In 1973 several kind of luring techniques were introduced such as payao with coconut leaves and kerosene lamp. Until 1982 the luring techniques (LPS) has been well developed by equipped electric generator on board and became the popular fishing gear for mixed species such as round scad, sardine, small tuna etc. The principle of LPS is to set the net after using light attraction, in addition, it can be operated as TPS method by searching the fish school and set the net while sailing to the destination of luring place. As a result, estimation of realistic effort values has become problematic. The common mesh sizes used in TPS and LPS are approximately 2.5 cm. while the length and depth of the seine range from 300 – 1100 m. and 50 – 130 m. respectively.

The other size of purse seine, green purse seine (GPS) which operated as same as TPS. The mesh size of the net is 3.8 cm. while the length and depth range from 450 – 1200 m. and 60 – 140 m. respectively. The fishermen used GPS to catch the medium and large size of Indo – Pacific mackerel which entered to the fishery from March to May.

For tuna purse seine, (TUNP) the size of the net range from 100 – 120 m. in depth, 800 – 1400 m. in length and 7.5 – 9.4 cm. mesh size.

Generally, purse seiner of size class 18 – 24 metres in lengths is the most popular in the Andaman Sea Coast, except TUNP which occupied more than 24 metres.

The registered number of purse seiners in the Andaman Sea area of Thailand divided into Chinese purse seine (CPS) and other purse seines (TPS, LPS, GPS and TUNP) are shown in **Table 1**.

## Species Composition

The main pelagic fish in the Andaman Sea caught during 1979 – 1991 consists of Indo–Pacific mackerel, Indian mackerel, round scads, small tunas and sardines which shared about 60 – 86% of all pelagic species during 1979 – 1991 (**Table 2**).

Observation made by staff of Andaman Sea Fisheries Development Center (AFDEC) on species composition of mackerels, small tunas and round scads are shown in **Table 3**. The species composition of Mackerels are consist of Indo–Pacific mackerel (*Rastrelliger brachysoma*) and Indian mackerel (*R. Kanagurta*) about 76% and 24% respectively. Four main species of small tunas are kawakawa (*Euthynnus affinis*), frigate mackerel (*Auxis thazard*), Longtail tuna (*Thunnus tonggol*) and skipjack tuna (*Katsuwonus pelamis*) which shared about 35%, 41%, 18% and 6% respectively. For round scads, the production are consists of *Decapterus maruadsi* 58% and *D. macrosoma* 42%. Besides these species, yellow fin tuna (*Thunnus albacares*) and bullet tuna (*Auxis rochei*) were also caught occasionally in a less quantity by purse seines in the upper part of Phuket Island.

## Fishing Gear

Production of Indo–Pacific mackerel, Indian mackerel round scads, small tunas and sardines are mainly caught by purse seines about 88%, 96%, 92%, 98% and 94% of catch from all gears respectively.

Observation made by staff of AFDEC during 1985 – 1990 on the production caught by types of purse seines are shown in **Table 4**. Indo-Pacific mackerel was mainly caught by GPS, while small tunas, round scads and Indian mackerel by LPS.

## Fishing Ground

The fishing ground for purse seines have been expanded along the Coast, with in the range 3 – 45 km. from shore and the depth range 30 – 100 m. as shown in Figure 1. The main fishing ground of Indo–Pacific mackerel are located in the lower part of the coast, but for Indian mackerel small tunas and round scads are located in the upper part of the coast and the area around Raja Island in the lower part.

## Fishing Season

Pelagic species, especially mackerel, round scads and small tunas on the west coast of Thailand were caught all year round. The peak of catch considered to be higher during the Northeast Monsoon (November to May) than the Southwest one. (**Figure 2**).

## Size Composition

Mode in the catch of small tunas, kawakawa was 18 – 35 cm. (range 8 – 58 cm.), frigate mackerel 18 – 32 cm. (range 9 – 44 cm.) and longtail tuna 24 – 36 cm. and 42 – 50 cm. (range 11 – 51 cm.).

For round scads, mode in the catch for *D. maruadsi* were 9 – 19 cm. (7 – 24 cm.) and for *D. macrosoma* were 14 – 22 cm. (9 – 25 cm.).

During the period 1985 – 1994 mean length by year of kawakawa and frigate mackerel are fluctuated and slightly different by year, but the mean length of Longtail tuna in overall view shown increasing trend (**Figure 3**). For round scads, the mean length are fluctuated and shown gradually decreased in overall view (**Figure 4**).

## Production and Catch Rate

The production of all pelagic species for overall view was increased during 1979 – 1991 but CPUE increased trend from 1437.6 kg./day in 1979 to high peak about 4280.3 kg./day in 1983 and then decreased until 1988 as shown in **Figure 5**. Production and catch rate of important economic species Indo–Pacific mackerel, round scads, small tunas and sardines are shown in **Figure 6**, **Figure 7**, **Figure 8** and **Figure 9** respectively.

### Estimated Potential Yield and Optimum Fishing Effort

Fox's model was applied to estimate the Maximum Sustainable Yield and the optimum fishing effort, by using the CPUE of purse seines as standard gear. The result are presented in **Table 5**.

### Biological Parameters

Some biological parameters of important economic pelagic species along the Andaman Sea Coast of Thailand are shown in **Table 6**.

### Status of Pelagic Species

Consideration of all parameters combining with other information on fishery, the result can be stated as follow:–

- the signs of overfishing have been observed for Indo–Pacific mackerel and sardines but in the same time, the recovery of these stock seemed to be gradually improved.
- No definite sign of overfishing has been observed for round scads, small tunas and all other pelagic species.

**Table 1: The Registered Number of Purse Seines in the Andaman Sea Coast of Thailand, 1979 – 1991**

<i>Year</i>	<i>CPS</i>	<i>Other Purse Seines</i>	<i>Total</i>
1979	15	71	86
1980	12	102	114
1981	14	144	158
1982	13	140	153
1983	18	135	153
1984	16	162	178
1985	17	152	169
1986	17	153	170
1987	14	208	222
1988	16	257	273
1989	16	264	280
1990	12	260	272
1991	24	217	241

Source: Thai Fishing Vessels Statistics, 1979 – 1991, Department of Fisheries (DOF), Thailand.

**Table 2: Total Catch and Species Composition of Pelagic Fish Along the Andaman Sea Coast of Thailand, 1979 – 1991**

Year	Total Catch (Tons)	Species Composition (%)					
		1	2	3	4	5	6
1979	30,997	14.5	9.3	3.4	6.8	35.5	30.5
1980	11,278	15.9	8.6	7.9	6.8	20.9	39.9
1981	14,062	15.8	5.9	8.4	14.7	14.6	40.6
1982	60,121	16.7	1.9	6.2	15.9	45.0	14.3
1983	64,109	20.5	3.0	14.9	6.0	38.3	17.3
1984	90,846	20.6	2.4	18.5	8.1	33.6	16.8
1985	67,952	20.2	1.3	8.8	6.2	30.3	33.2
1986	59,560	23.0	1.6	4.1	5.7	44.4	21.2
1987	20,563	12.5	1.9	11.8	5.2	34.5	34.1
1988	98,912	12.2	5.6	17.9	4.9	33.0	26.4
1989	121,646	14.4	5.9	18.4	3.9	24.0	33.4
1990	146,281	17.2	6.9	15.4	4.7	18.7	37.1
1991	176,794	21.8	8.3	13.6	8.1	13.7	34.5

Source: The Marine Fisheries Statistics, base on the sampling survey 1979 – 1991, DOF, THAILAND.

- Note:
1. Indo-Pacific mackerel.
  2. Indian mackerel.
  3. Round scads.
  4. Small tunas.
  5. Sardines.
  6. Others.

**Table 3: Species Composition of Mackerels, Small Tunas and Round Scads Along the Andaman Sea Coast of Thailand, 1991 – 1994**

<i>Pelagic Groups</i>	<i>Species</i>	<i>%</i>
Mackerels	R. brachysoma	76
	R. kanagurta	24
Small tunas	E. affinis	35
	A. thazard	41
	T. tonggol	18
	K. pelamis	6
Round scads	D. maruadsi	58
	D. macrosoma	42

Source: From the sampling survey conducted by Andaman Sea Fisheries Development Center (AFDEC) Phuket, Thailand.

**Table 4: Percentage of Important Pelagic Species Caught by Type of Purse Seines Along the Andaman Sea Coast of Thailand, 1991 – 1994**

<i>Type of Purse Seines</i>	<i>Production Caught by Type of Purse Seines (%)</i>				
	<i>Indo-Pacific Mackerel</i>	<i>Small Tunas</i>	<i>Round Scads</i>	<i>Indian Mackerel</i>	<i>Sardines</i>
CPS	—	—	—	2	1
TPS	18	15	5	6	24
LPS	16	63	95	90	75
GPS	66	3	—	2	—
TUNP	—	19	—	—	—

Source: From the sampling survey conducted by AFDEC, Phuket, Thailand.

**Table 5: Maximum Sustainable Yield and Optimum Fishing Effort of Pelagic Species Along the Andaman Sea Coast of Thailand.**

<i>Species</i>	<i>MSY (tons)</i>	<i>Fopt (day)</i>	<i>r</i>	<i>Remark</i>
<i>R. brachysoma</i>	24,100	69,200	- 0.62	Data 1982 - 1991
<i>Small tunas</i>	22,700	92,000	- 0.50	Data 1979 - 1991
<i>Sardines</i>	32,400	38,800	- 0.98	Data 1982 - 1991
<i>Round scad</i>	—	—	+ - - -	—
<i>All Pelagic Species</i>	190,000	161,200	- 0.68	Data 1982 - 1991

**Table 6: Biological Parameter of Pelagic Species Along the Andaman Coast of Thailand**

<i>Species</i>	$W = aL^a$		<i>Size at 1<sup>st</sup>. mature</i>	<i>Spawning season</i>	<i>K and L</i>
	<i>a</i>	<i>b</i>			
<i>R. brachysoma</i>	0.01296	3.2104	178 mm.	Dec. - March, Aug. - Nov.	2.1 /year 21.0 cm.
<i>E. affinis</i>	0.00001731	2.9992	370 mm.	Jan. - March, June - July	
<i>A. thazard</i>	0.00002316	2.9617	340 mm.	Feb. - April, Sept.	
<i>T. tonggol</i>	0.00002493	2.9471	400 mm.	March - May, Aug. - Dec.	

Source: Boonraksa, V. 1993 (in Thai).  
Pimoljinda, J. 1978 (in Thai).  
Saranakomkul, K. 1985 (in Thai).  
Sutthakorn, P. 1986 (in-Thai).