



**THE THIRD REGIONAL WORKSHOP ON SHARED STOCKS
IN THE SOUTH CHINA SEA AREA**

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**COUNTRY STATUS REPORT
INDONESIA**

**THE SMALL PELAGIC FISHERIES RESOURCES
AND THEIR MANAGEMENT MEASURES IN THE
SOUTH CHINA SEA AREA OF INDONESIA**

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1. INTRODUCTION

Indonesia is an Archipelagic country consisting of more than 18,000 island, and about 5.8 millions km² of marine waters. In order to fisheries management the Indonesian waters has grouped into 9 coastal waters which one of those is South China Sea Area (Fig. 1).

South China Sea Area of Indonesia consists of many island bordering to Riau, Jambi, South Sumatera and West Kalimantan Provinces. The marine fisheries resources are mostly utilized by fishermen from provinces bordering to this area, but also from other provinces, mainly from Central Java, Jakarta and chartered boats. The present exploitation condition of marine fisheries resources in this area are still under-developed. Since about 1986 the marine fisheries in the IEEZ of South China Sea Area have developed remarkably, starting from 45 boats in 1986 to 8,813 boats in 1995 foreign and national boats or increasing about 67% annually (Fishing Boats Statistics Operated in the IEEZ, 1997).

In this report presented the data were collected from Jambi, South Sumatera and West Kalimantan Provinces.

2. THE EXISTING FISHERIES

2.1. Fishing Gears

There were various gears used by fishermen in the area, such as Payang, Danish seine, Beach seine, Purse seine, Drift gill net, Encircling gill nets, Set gill net, Lift net, Troll line and traps. The most important gears used for small pelagis fisheries are presented in Appendix Table 1. Troll line was increasing very fast, faster than Purse seine and any other gear. Purse seine developed in this area since 1989, increasing about 12% annually (1989-1995). Payang was also increasing but not as fast as Purse seine.

Since 1980's, some Purse seiners from Central Java Province have been operating to this area, mainly in the East Season. The seiners operating in this area are still increasing and mostly large seiners fishing days 30-45 days/trip.

The small scale fisheries used were non power boats and power boats. The number of non powered boats were increasing every year about 1% but powered boats were increasing 7% and 4% respectively for out board and inboard motors.

The size of inboard motors are ranging from under 5 GT to 50 GT. The number of fishing boats operating in IEEZ, the foreign flagged (chartered) and Indonesia flagged boats by type of fishing gears are presented in Table 1.

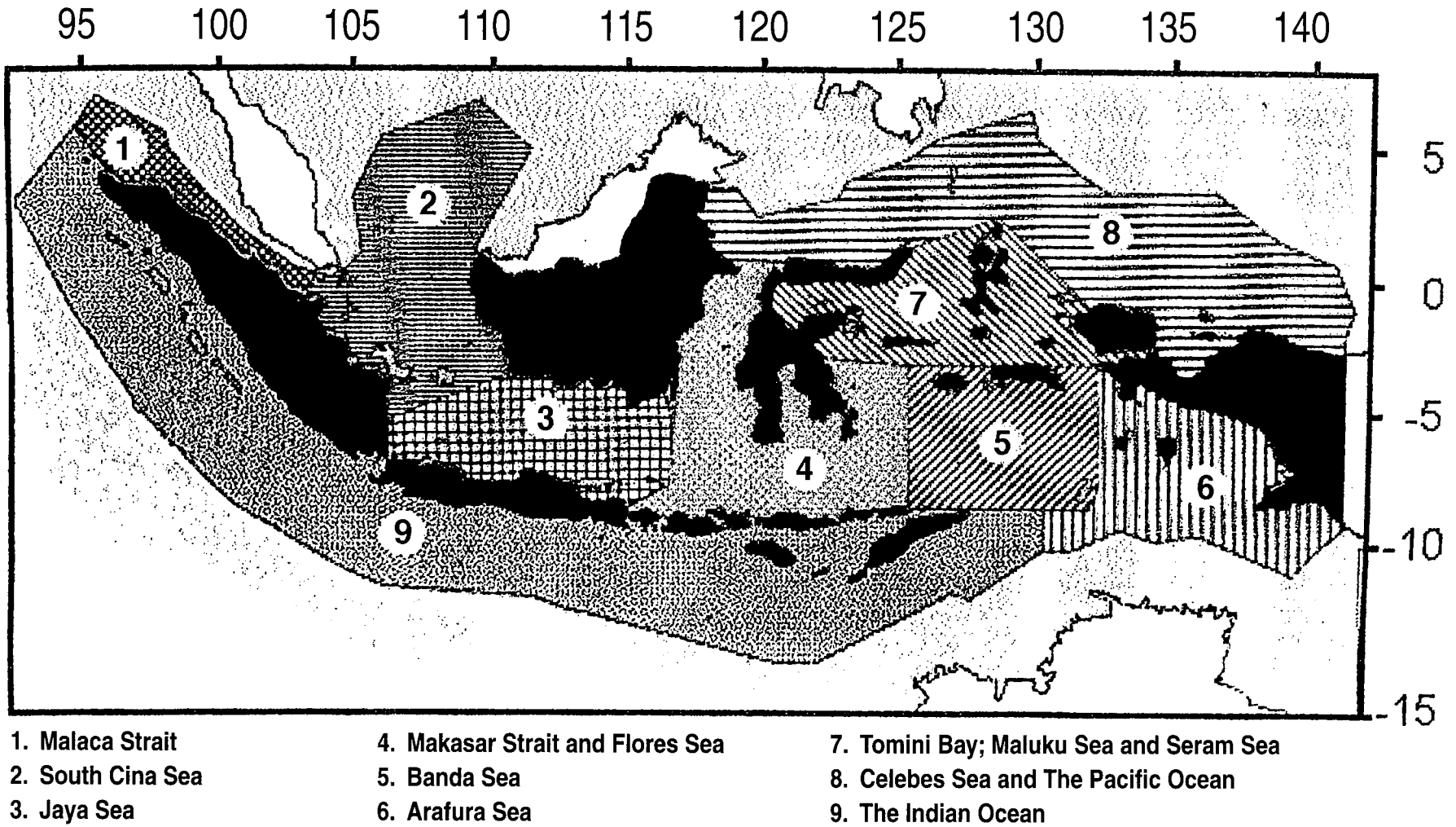
Table 1: Number of Foreign and Indonesia Fishing Boats Operating in IEEZ of South China Sea, by Type of Gear (1986 - 1995)

Gears Years	Type of Gears						Total
	LL	PS	GN	FN	FC	PU	
1986	-	24	-	-	21	-	45
1987	-	191	-	13	9	-	213
1988	140	238	40	163	9	-	590
1989	30	206	46	219	19	-	510
1990	-	437	82	312	7	-	838
1991	12	501	119	368	3	-	1,003
1992	9	266	143	485	3	-	906
1993	21	426	144	539	6	43	1,183
1994	16	165	99	523	-	-	803
1995	3	125	98	497	-	-	723

Remark: LL = Long liner FC = Fish carrier
 PS = Purse seiner PU = Shrimp net
 GN = Gill netter FN = Fish net

Source: Fishing Boats Statistics
 Operated in IEEZ of South China Sea, 1997

Figure 1: The Management Areas of Marine Fisheries Resources In The Indonesian Waters



2.2. Production

Marine Fisheries production are recorded as species groups in fisheries Statistics of Indonesia. There are 18 species groups of small pelagic, 4 large pelagic and 20 demersal fishes were catching from this area. Skipjack, Hardtail scad, Rainbow runner were recorded individually, are not mixed with other species. The production by species groups of small pelagic fishes from 1989 to 1995 is presented in Appendix Table 2. The average dominant species for 1989 - 1995 were *Sardinella* spp; oil sardine; *Rastrelliger* spp. In Appendix Table 3 is presented the total production of marine production by species groups in the South China Sea of Indonesia for 7 years periods (1989-1995, 1989-1995).

The production of small pelagic fishes in this area were increasing about 4.62% annually. This due to the increasing number of Purse seiner, Payang and other gears operating in this area.

The production by dominant gears for small pelagic fishes are presented in Table 2. In the table indicated no. of unit; total catch and catch per unit effort (CPUE) for dominant gears.

Table 2: The Production of Dominant Gears for Small Pelagic Fishes in the West Kalimantan, Indonesia, 1989-1995

Gears			Years						
			1989	1990	1991	1992	1993	1994	1995
1	Payang	F	370	21	146	21	147	153	60
		C	7,332	93	80	89	7,855	535	2,085
		CPUE	19.8	4.42	0.55	4.24	53.90	3.50	34.75
2	P. Seine	F	4	6	12	6	6	21	23
		C	1,780	1,978	1,277	1,930	2,458	5,263	5,807
		CPUE	445	330	106	332	410	251	253
3	Drift GN	F	880	1,375	955	875	883	852	943
		C	16,386	10,922	14,765	16,106	19,332	16,397	15,377
		CPUE	20	8	15	18	22	19	16
4	Encircling GN	F	145	234	144	173	178	185	225
		C	2,537	2,438	2,368	2,677	2,783	4,783	6,507
		CPUE	17	11	16	15	16	26	29
5	Lift net	F	560	777	602	607	566	544	538
		C	2,801	3,277	3,522	3,259	1,896	2,486	2,399
		CPUE	5.0	4.2	5.9	5.4	3.3	4.6	4.5
6	Troll line	F	130	106	177	161	187	210	194
		C	558	869	554	604	667	705	695
		CPUE	4.3	8.2	3.1	3.8	4.0	4.6	3.6

The Table 2 indicated that the fluctuations of CPUE of Payang, may be some misrecorded in the number units of gear, but the others gears indicated, a little decreasing.

2.3. Level of Explotation

The small pelagic fishes potentials in South China Sea of Indonesia was assessed in 1991, 1995 and 1997 as Table 3.

Table 3: The Small Pelagic Fishes Potentials in South China Sea of Indonesia

Years	Area (Km ²)	Density (ton/Km ²)	Potential Yield (10 ³ ton)	Landing Catch (10 ³ ton)	Exploitation rate (%)
1991 (a)	595	0.56	330	75	22.73
1995 (b)	595	0.60	357	75	21.01
1997 (c)	558	0.92	513	150	29.24

- Sources:
- (a) The potential assessment of marine fisheries resources in Indonesia Waters Directorate General of Fisheries, Jakarta, 1991
 - (b) Workshop on Stock Assessment of Marine Fisheries Resources in Indonesia, FAO/DANIDA, Jakarta 1993.
 - (c) The Potentials Assessment of Marine Fisheries Resources in Indonesia Waters, DGF, 1997.

The above table, indicated the level of explotation for small pelagic fishes in South China Sea of Indonesia is still under fishing. There is still possibility for expantion.

3. BIOLOGICAL PARAMETERS

Since the Workshop on Shared Stocks in the Southeast Asia were conducted to review the possibility of shared stocks in this area for marine fisheries resources. There is no any research activities carried out yet in South China of Indonesia to support the identification of shared stocks. But in 1996, was began to collect the landing catch of Purse seine in West Kalimantan and length frequentis data for 5 species of small pelagic fishes. Those data, are not yet analyzed to produce the biological parameters.

The Java Sea Pelagic Fishery Assessment Project (the collaboration of ORSTOM, France and Research Institute for Marine Fisheries, Jakarta) which was establish in 1991, has been monitored the catch landing of seiners which were operating in the South China Sea Area. The landing place of the seiners in Central Java Provinces. The data consists of catch by species and length frequentis measurement for small pelagic species. The result of this activities is not yet published.

4. FISHERIES MANAGEMENT MEASURES

The most serious management problems facing Indonesian fisheries policy makers are related to coastal waters where the vast majority of fisheries operate. Many of these fishing grounds are heavily exploited by large numbers of small scale fishermen, who are limited to inshore operations by existing boats and gears. Existing management regulations reflect concern for protecting both vulnerable resources and rights of access to inshore fishing grounds by small scale fishermen.

There were some fisheries management in Indonesia waters, (which are also effected in the South China Sea), as follows:

- (a) The Minister of Agriculture, issued Decree 56/1973, calling for the rational exploitation of fisheries resources;
- (b) The Minister of Agriculture issued Decree 1 of 1975 established that Ministry's authority to limit fishing effort in marine fisheries by regulating (1) seasons of operations, (2) type, size and number of boats in a particular areas and (3) size of mesh that could be used;
- (c) The Ministerial Decree 607, was issued in 1976 establishing a series of coastal zones parallel to the shore in which operations of various types of boats (categorized by both hull size and engine power) were restricted. This Decree is now under discussion for revision. The coastal belts established by this Decree are still in force and are summarized in Table 4.
- (d) The Minister Decree No. 15/1990, licencing for fishing vessel < 30 GT/90 HP is issued by Province Fisheries Service and for > 30 GT issued by Directorate General of Fisheries. Where as, there are no fishing license for small boat/canoes of < 5 GT/unmotorized due to the fishing activities only appraised as subsistence activity only. For the last category, the fishermen should reported their activity for statistic data and fisheries resources management measurement.

Table 4: Zones of Operation for Fishing Boats Established by the Minister of Agriculture's Decree 607 in 1976.

Zone	Distance from Shore	Close to
I	0.3 nautical miles	<ol style="list-style-type: none"> 1. Boats with inboard engines displacing over 5 GT; 2. Boats with inboard engines over 10 hp; 3. All types of trawl gear; 4. All purse seines; 5. Encircling gill nets and drifting gill nets for tuna; 6. Seine nets longer than 120.
II	3-7 nautical miles	<ol style="list-style-type: none"> 1. Boats with inboard engines displacing over 25 GT; 2. Boats with inboard engines over 50 hp; 3. Otter trawls with head ropes longer than 12 m; 4. Midwater trawls and pair trawls; 5. Purse seines longer than 300 m.
III	7-12 nautical miles	<ol style="list-style-type: none"> 1. Boats with inboard engines displacing over 100 GT; 2. Boats with inboard engines over 200 hp; 3. Demersal and midwater trawls using otter boards equipped with headropes over 20 m in length; 4. Pair trawls; 5. Purse seine longer than 600 m.
IV	Over 12 nautical miles	<ol style="list-style-type: none"> 1. Pair trawls, except in the Indian Ocean where they are permitted.

Note: Except for trawlnet fisheries since 1980 by the President's degree no: 39/1980 about the trawl ban in the western part in Indonesia waters.

5. CONCLUSIONS

1. The production of Small Pelagic Fishes is increasing due to the increasing of the gear operating in this area, mainly purse seine, gears;
2. Up to present, data collection on small pelagic fishes, are carried out by the Java Sea Pelagic Fishery Assessment Project from Central Java seiners operating in South China Sea Area;
3. Small pelagic fishes in the South China Sea at Indonesia is still under exploited;
4. Research activities area urgently needed to support shared stock identification, utilization and management in the area;
5. As a whole at government policy in fisheries management, presently has been taken practically regulations in related to small pelagic fishes i.e.: fishing zonation in certain area of bordered with dense population, conservation and protection of certain species, implementing MCS Program.

Appendix Table 1

The Development of Some Main Gears Used in South China Sea Area

Year	Payang	Beach seine	Purse seine	Drift G.N.	Enc. G.N.	Shrimp G.N.	Set G.N.	Trammel net	Troll line
1982	341	269	-	1,678	389	2,648	1,582	-	-
1983	392	435	-	4,206	379	2,560	1,498	-	-
1984	450	443	2	3,708	329	2,456	1,762	703	42
1985	431	753	2	3,076	321	2,300	1,864	747	45
1986	599	656	2	3,754	471	2,199	1,864	1,137	96
1987	649	649	4	3,711	465	2,358	1,452	1,004	90
1988	661	429	4	3,108	411	2,268	1,766	1,023	132
1989	1,064	332	4	3,331	330	2,532	1,839	984	130
1990	842	781	6	6,145	533	2,462	2,908	2,138	431
1991	1,094	407	12	3,363	432	2,423	1,663	936	177
1992	1,113	834	6	5,826	465	2,852	3,113	1,739	889
1993	1,530	866	6	6,039	478	3,120	3,206	1,591	1,210
1994	1,265	1,069	21	6,340	451	2,491	3,194	1,804	1,165
1995	2,429	1,742	23	6,765	434	2,024	4,359	1,463	760

Source: Directorate General of Fisheries (1984 - 1994)

Appendix Table 2:

The Production by Species of Small Pelagic Fishes in South China Sea of Indonesia, 1989 - 1995

Unit: Ton

No	Species	1989	1990	1991	1992	1993	1994	1995	Average	(%)
1	Barracuda <i>Sphyraena</i> spp	759.8	852.8	898.0	1,050.0	970.3	183.3	1,437.0	878.7	0.70
2	Roundscads <i>Decapterus</i> spp	25.9	27.6	256.0	-	199.0	202.0	1,261.5	281.7	0.20
3	Trevalies <i>Selar</i> spp	7,893.9	8,086.1	9,500.6	9,376.0	7,905.9	9,165.8	11,563.6	9,070.3	7.00
4	Hardtail scads <i>M. cordyla</i>	683.1	707.1	887.5	875.5	1,063.0	988.9	706.3	844.5	0.60
5	Queen fishes <i>Chorinemus</i> spp	1,750.3	2,151.1	2,008.0	2,126.7	2,300.4	1,928.3	3,250.1	2,216.4	1.70
6	Rainbow runner <i>E bipinnulatus</i>	97.0	119.0	120.0	122.0	147.0	268.0	287.0	165.7	0.10
7	Mulletts <i>Mugil</i> spp	2,489.0	2,495.0	3,981.9	3,997.9	4,152.1	4,323.9	2,741.4	3,454.5	2.70
8	Needle fishes <i>Trichiurus</i> spp	1,117.0	1,609.7	1,720.0	2,362.2	1,838.6	1,128.6	1,729.6	1,643.7	1.30
9	Anchovies <i>Engraulidae</i>	7,591.3	7,463.3	8,489.8	8,211.8	7,977.1	8,438.8	10,902.9	8,439.3	6.50
10	Rainbow sardines <i>Dussumieria</i> spp	1,947.0	1,009.0	2,288.0	2,336.0	4,358.0	4,290.0	5,108.0	3,048.0	2.30
11	Fringscale sardinellas <i>Sardinella</i> spp	17,696.3	17,340.0	16,518.6	16,707.6	15,185.9	14,478.1	14,538.4	16,066.0	12.40
12	Indian oil sardine <i>A. sirm</i>	7,920.0	8,082.0	8,126.0	8,250.0	7,352.0	8,444.0	9,522.0	8,242.3	6.0
13	Wolf herrings <i>Chirocentrus</i> spp	7,049.3	6,987.3	6,014.5	6,135.5	6,636.6	7,478.6	10,252.8	7,225.9	5.60
14	Tolishads/chineseherrings <i>I. tolli</i>	125	132	-	-	-	-	-	36.7	0.01
15	Indianmacherels <i>Rastrelligel</i> spp	9,653.4	9,785.4	9,314.8	9,818.8	10,754.5	16,949.4	8,456.8	12,104.7	9.40
16	Seerfishes <i>Scomboromorus</i> spp	10,738.0	11,278.0	9,649.8	10,115.8	9,805.7	10,462.4	14,640.8	10,947.2	8.50
17	Small tunas <i>Euthynnus</i> spp <i>Auxis</i> spp	12,981.0	9,785.4	8,390.5	14,714.5	14,829.8	16,475.2	18,690.3	13,696.2	10.50
18	White pomprets	1,827.6	1,845.6	3,531.2	3,502.2	3,809.7	2,686.9	4,317.2	3,074.3	3.40
19	Black pomprets	3,897.4	4,059.4	1,959.2	1,991.2	2,037.5	2,258.6	2,650.2	2,693.4	2.10
20	Others	25,018.4	25,368.9	24,982.5	22,782.5	26,741.1	26,425.9	25,623.6	25,277.6	19.50
Total		123,333.1	127,660.2	120,263.2	126,046.9	129,838.3	130,413.3	157,251.6	129,407.1	100

Note: The production is not included the landing catch of purse seine form north coast of Java which are fishing ground in the South China Sea Area

Appendix Table 3:

Production of Marine Fishery in Southern Part of South China Sea Area by Group of Species.

Unit: Ton

Year	Small P	Large P	Demersal	Crustacea molluces	Total
1989	124,812	41	89,016	37,542	251,411
1990	129,248	-	88,810	38,058	256,116
1991	121,725	97	103,704	42,060	267,489
1992	127,892	-	99,691	56,568	284,151
1993	131,752	-	109,042	51,636	284,670
1994	133,344	-	117,288	39,941	290,573
1995	159,789	703	130,179	52,426	343,097
Increase (%)	5.00	-	7.70	6.61	6.08

Appendix Table 4:

Number of Boats, Days at Sea, Catch of Pelagic Fish by Seiners from Central Java Recorded from Pekalongan Landing Place

Years	Number of Boats	Days at Sea	Catch (kgs)	Fishing Ground	CPUE (kg/Day)
Large seiner					
1992	106	2,974	3,074.17 7	A	1,033.7
	2	69	49,596	C	718.8
1993	123	3,896	5,350.17 9	A	1,373.2
	132	4,367	5,801.88 1	B	1,328.6
	1	37	40,235	C	1,087.4
1994	96	3,327	4,637.70 3	A	1,394.0
	2	46	70,545	C	1,533.6
Average				A	1,267.0
				B	1,328.6
				C	1,113.3
Year	Number of Boats	Days at Sea	Catch (kgs)	Fishing Ground	CPUE (kg/Day)
Medium seiner					
1991	6	112	84,593	A	755.3
	29	296	143,710	C	485.5
1992	6	86	71,193	A	827.8
1993	4	56	84,861	A	1,517.4
	7	149	224,148	B	1,504.3
1994	17	670	722,313	A	1,078.1
	1	180	189,717	B	1,054.0
Average				A	1,044.6
				B	1,279.2
				C	485.5