Revised

CCSBT – ESC/1009/SBT FISHERIES – Indonesia

NATIONAL REPORT[1]

INDONESIA SOUTHERN BLUEFIN TUNA FISHERY

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SUMMARY : Southern bluefin tuna (*Thunnus maccoyii* – SBT) is one of tuna species seasonally caught by longline fishery in Indonesia. Other large commercial tuna species such as *Thunnus albacares*, *Thunnus obesus*, and *Thunnus alalunga* are the main species landed by this fishery. Initially there were some weaknesses on data and information available to this SBT species that only limited to the total production of aggregated tuna landed making it difficult to use the data for SBT stock assessment purpose. Since mid 2002 there was several years of scientific collaboration with international tuna fisheries bodies namely IOTC/OFCF/RCCF/DGCF/CSIRO in order to develop routine sampling, data base building and its management that appropriate for SBT stock assessment purposes. Since February 2010 the sampling, collecting and monitoring activities of this fishery has been start conducted by a national program under annual research program of Research Institute for Marine Fisheries, Agency for Marine and Fisheries Research and Development, Indonesia. This report briefly described the catch, fleet structure, size composition and the activity of scientific observer during 2009 until the first semester of 2010.

INTRODUCTION:

The longline fishery in Indonesia is the most important ocean fishery. The early development of tuna longline fishery in Indonesia has been dominated by distant water longline fleets of Japanese type since the 1975's. The numbers of registered tuna longline fishing vessel operated in Indian Ocean decreased in 2007 compared to 2000 from 1795 to 1075 fishing vessels (IOTC, 2009). Longline was the only method that Indonesian commercial fleets used to catch southern bluefin tuna (SBT) and most of them were landing in Benoa fishing port. Catch data on southern bluefin tuna (*Thunnus macoyii*, SBT) by tuna longline fleets in Benoa fishing port contributed 0.37% in numbers of total 4 species tuna and 1.52% in weight of longline fishery targeting albacore and bigeye tuna for the past 5 years (www.atlibali.com) while at national level, it contributed 640 tons or 0.46% in weight of total tuna species (DGCF, 2009). The annual catches of

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SBT landed in Indonesia and the estimate catch contribution of Indonesia to the total SBT by member and non member country for about 5.9% as shown in Figure 1. However, previous investigation indicated that Indonesian based longline vessels fishing on northern part of the spawning ground in the north – east Indian Ocean (Farley and Davis, 1998). Since became a member of CCSBT in the early year of 2008, Indonesia committed to provide catch and effort statistics, logbook data, and fishing vessel information, as is required under the Highly Migratory Species Convention. This report will also briefly describe the progress of the data related to the landing of SBT particularly in 2009.

DATA AVAILABILITY:

There are some sources of data that used in this report such as catch data obtained from several sources i.e.: www.ccsbt.org; www.atlibali.com; www.iotc.org and annual report of National Statistics on Capture Fisheries (DGCF, 2009). The data of biological measurements of SBT were provided by enumerators while the operational activities of scientific observers data were available from Benoa Tuna Research and Monitoring Station (BTRMS).

CATCH DATA:

Catch data were regularly recorded by the enumerators located at the two main fishing ports of oceanic fisheries namely Benoa (Bali) and Cilacap (Central Java). These two main fishing ports were the main source of landing data from Fisheries Management Area of 572 (Indian Ocean – west Sumatera) and 573 (South of Java – east Nusa Tenggara). Data were regularly recorded and reported as monthly reports, logbooks and other report forms as part of annual capture fisheries statistical report. Several modifications of logbooks were made and implemented in tuna fishing vessels and the data are still under process to analyse. The monthly catch data both Benoa and Cilacap in year 2009 (table 1) showed that the highest of total catch occurred in January (197.1 tons) and the lowest is in June (1.27 tons). Most of the catch (97%) was landed at Benoa (DGCF 2010). The monthly catch data also revealed that January, February and March were peak fishing season of SBT for Indonesian fishing fleet.

The average weight landed at Benoa and Cilacap during period of 2006 – 2009 (excluding August 2009) ranged between 45.0 to 151 kg (Figure 2). The figure also indicated that the average weight of SBT landed at Benoa and Cilacap for September to April were relatively stable within 90 – 110 kg. In contrast, during May to August the weights had a wider range and fluctuated within 40 – 150 kg.

The accumulative catch of SBT (Figure 3), informed that a significant increasing catch mainly occurred in the first quarter (January to March) and the last quarter (October to December). These suggesting that the

peak catch of SBT occurred during October – March, particularly during the first quarter from January to March. The monthly landing of 2008 and 2009 did not show the same pattern in which the accumulative catch in 2009 shows that 80% of total quota reached on March – April, while in 2008 on October – November.

Monthly catch composition has also informed that the highest catch of SBT occurred within January to March. Other tuna increased in number during April to September, particularly in June and July. The monthly catches in the year of 2009 was well below the Indonesia catch quota than in the year of 2008. The accumulative catch 2008 was already exceeding just above the Indonesian catch limit. These data informed that the first quarter (January to March) was the peak fishing season of SBT for the Indonesian fleet, not only the number but also the size of SBT which was larger. During May to August there were low fishing season of SBT with lowest number in catch and smaller size of SBT. In the other hand, the catch of other tuna species tend to increase in these period (May to August). Fishermen targeting SBT might better to fishing during January to March rather than May to August (Figure 4).

SCIENTIFIC OBSERVER PROGRAM:

The scientific observer activities were recorded since 2005 until early 2010. The number of scientific observer decreased from 6 in 2007 becomes 5 persons in 2008. The average day sea /trip was varied from 20 d/trip to 50 d/trip thus the total day at sea also varied from 150 days to 758 days /total number of observer (Table 2). The fishing areas observed were mainly located at south of 10 ^{o} (Figure 5). They also showed at least two clusters of fishing operation followed by scientific observer since 2005 that is 10 – 16 S and 110 – 120 E and 20-33 S – 100–105 E. These space and time sampling distributions depended on where the fishing vessels operated. The figure shows that sampling was not performed in a normal distribution but aggregated or clumped. Since 2005 to 2010 there were at least 4 different monthly cluster of sampling distribution. During 2006, sampling mainly occurred in September and November. In 2006 and 2007 the sampling conducted in a wider range from 10 to 33 ^{o}S.

There are some tendencies that sampling in 2008 until the early of 2010 were carried out in the shorter distance (lower latitude) between 10 to 15^{o} south compared with previous years. This inconsistence situation probably related to some technical reasons, i.e. trips of the fishing vessels were longer than previous year with the average day at sea increased from 6 months to 1 year, some fishing vessels had changed their fishing tactics from fishing with target species to broader (multi species) due to increasing the fuel price. In some cases, some tuna fishing vessels modified their fishing gear to the squid jigging and this might also influence the sampling program.

SIZE COMPOSITION:

Length frequency distribution of SBT measured by scientific observer since 2005 revealed a wider range of 126 – 220 cm. The size mainly distributed from 150 cm – 200 cm (Figure 6a). Table 3 shows the decreasing number on specimens measured observation during period of 2005 - 2010, the highest measured specimen decrease from 146 in 2006 to 11 in 2009.

The annual plot of length frequency by latitude coverage showed that the catch relatively exist in a similar range (scatter plot latitude by year to length were showed in Figure 6b) even the coverage latitude were mostly in lower latitude.

Enumerator activities on biological aspect during 2009 were published by Farley *et al*., (2010) as part of the CSIRO – RCCF – AFMR collaboration (see: CCSBT-ESC/1009/17). This report indicated that mean length declined from 188.1 to 166.8 cm between 1993/94 and 2002/03, and fluctuated between 168.3 and 171.0 cm for the following six seasons. In 2009/10, the median length of SBT caught was 168.5 cm as indicated in Figure 7.

BY CATCHES:

By catch species reported by enumerator landed at Benoa was at least consisted of 13 species. The biggest proportion was Swordfish *Xiphias gladius* (37.8%), Blue marlin *Makaira mazara* (29.1%) and Black marlin *Makaira indica* (8.8%). The caches reported by scientific observer that at least 25 species were caught in tuna long line fishing fleet. Stickle pomfret and Black escolar were among the largest of 25.5 % and 10.5 % respectively. There are also reported that *Bigeye Thresher shark, Pelagic thresher shark, Mako shark, Sunfish, and scalloped hammerhead* caught by tuna longliner in 2009 was relatively in small number. By catch species composition on landing site and onboard were listed in table 3 and 4 in the appendix.

OTHER MATTERS

Typical tuna longliner operated in the Indian Ocean and the profile of port of Benoa were shown in Figure 8.

ACKNOWLEDGEMENT:

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to Mr.Craig Proctor who has supervised the operational aspects of sampling techniques during scientific collaboration with CSIRO.

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Appendix 1

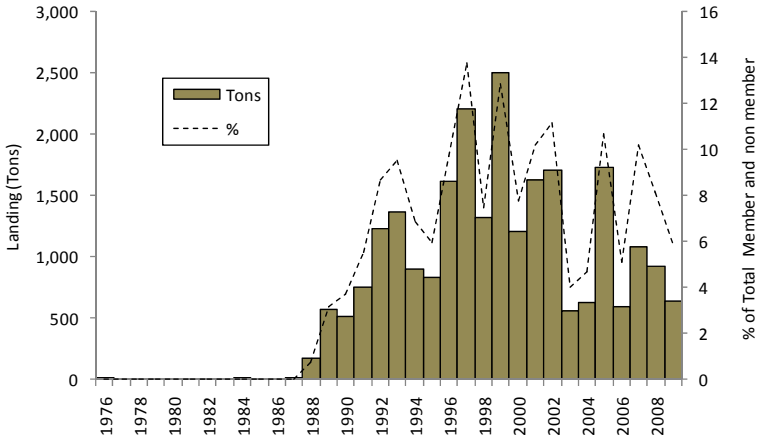


Figure 1. The annual catch of SBT landed in Indonesia
Source: www.ccsbt.org

Table 1. Monthly landing of SBT in 2009.

Month	Benoa		Cilacap		Total	
	N	W (kg)	N	W (kg)	N	W (kg)
January	1920	194912	17	2120	1937	197032
February	1600	157416	36	4359	1636	161775
March	1125	121142	53	6356	1178	127498
April	447	51901	4	508	451	52409
May	31	3693	0	0	31	3693
June	25	1266	0	0	25	1266
July	162	15365	0	0	162	15365
August	77	40006	0	0	77	40006
September	175	19585	0	0	175	19585
October	103	9367	0	0	103	9367
November	86	7672	0	0	86	7572
December	56	5013	0	0	56	5013
TOTAL	5087	627338	110	13343	5917	640681

Source : DGCF (2010) in www.ccsbt.org

Appendix 2

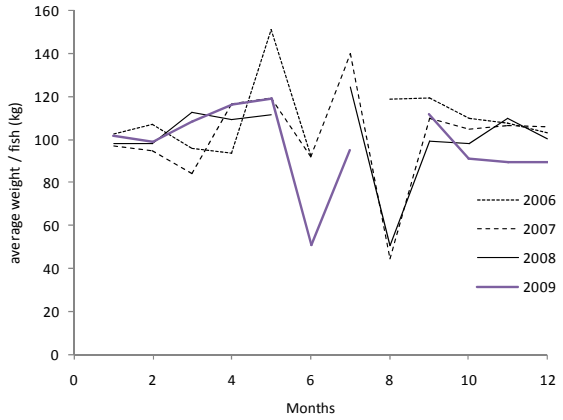


Figure 2. Monthly average weight (kg/fish) of landed SBT (2006 – 2009)

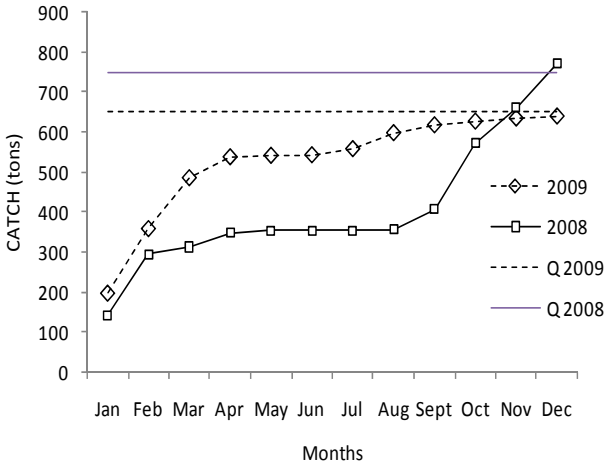


Figure 3. The accumulative catch of SBT in 2008 and 2009

Appendix 3

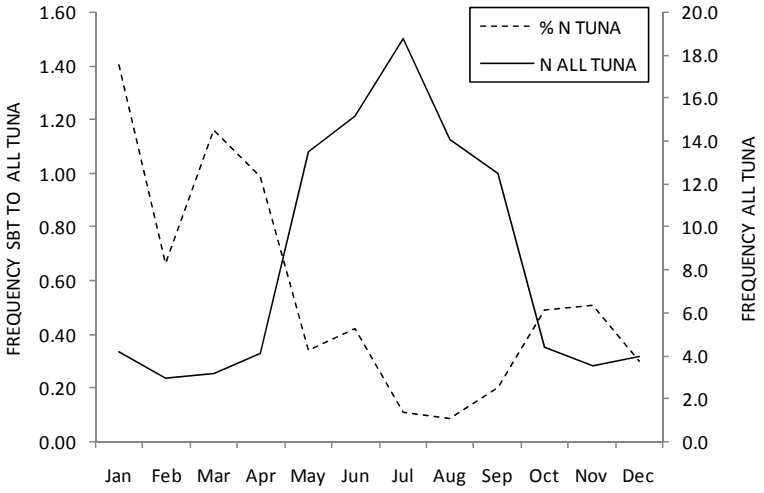


Figure 4. Monthly catch composition (%) of SBT to total tuna and all tuna species

Table 2. The scientific observer annual activities in Benoa Tuna Monitoring Station

YEAR	No. of Obs	No. of trips	No. of Comp	Total day at sea	d/trip	Avg (d/trip)
2005	6	6	1	251	19 – 22	20
2006	6	19	5	758	7 – 99	39
2007	6	14	5	648	21 – 108	34
2008	5	15	7	481	23 – 66	30
2009	5	14	8	535	15 – 59	38
2010*	5	3	3	150	50	50

Remarks : * data up to June 2010

Appendix 4

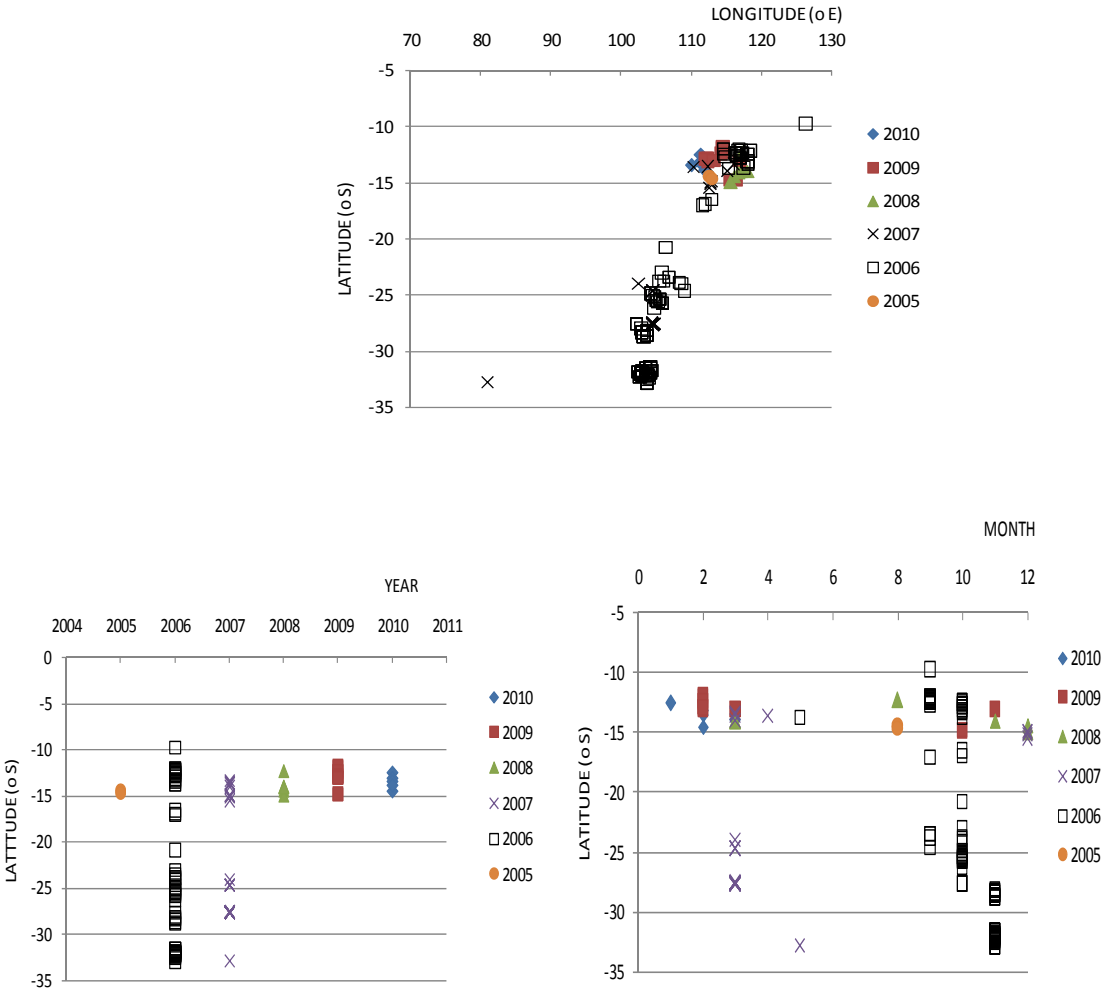
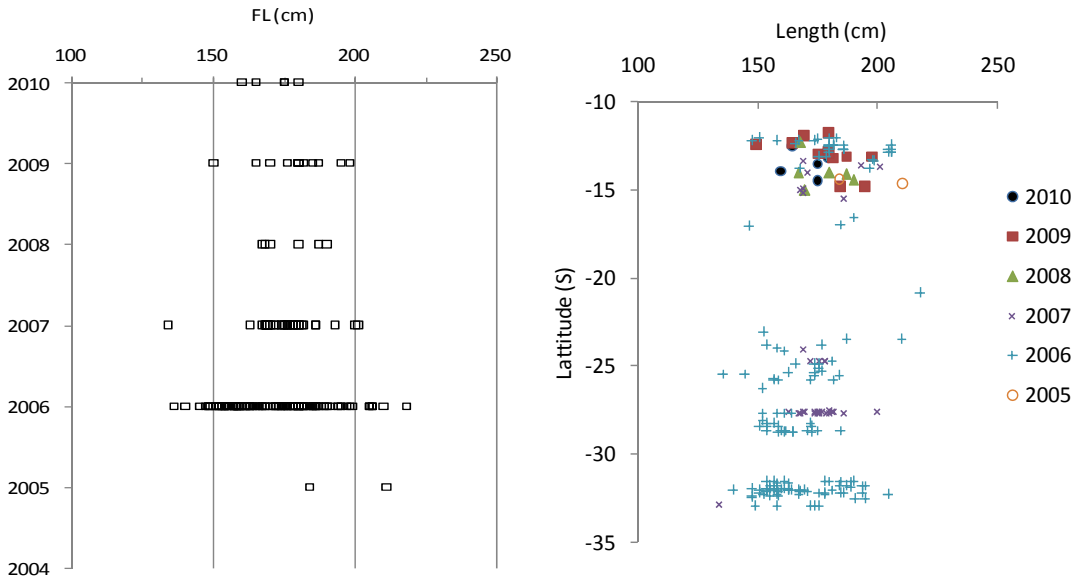


Figure 5. Sampling distribution (above), Sampling by year by Latitude (left – below) and distribution of sampling by month by scientific observer (right – below) during period of 2005 – 2010.

Appendix 5



(a) (b)

Figure 6. Length frequency by year (a) and by latitude coverage by scientific observers (b)

Table 3. The biological observation by scientific observer (2005 – 2010*)

	2005			2006			2007			2008			2009			2010*)		
FL (cm)	M	F	U	M	F	U	M	F	U	M	F		M	F	U	M	F	U
130																		
135							1											
140					1	1												
145						1												
150				1	5										1			
155					11	7												
160				5	11	5										1		
165					11	4									1		1	
170				4	5			2	1		3				1			
175				3	8	3	5		1							1	1	
180				11	8	1	7				1		1	1	1		1	
185		5		8	4	1	1						3					
190				4	7		2			1	1		1					
195				4	2		1											
200				2	1		1						1					
205				1	2			1										
210				2	1													
215		1																
220					1													
Total by sex	0	6	0	45	78	23	18	3	2	1	5	0	6	1	4	2	3	0
Total		6			146			23			6			11			5	

Remarks : M = Male; F = Female; U = unidentifed *) =up to June 2010

Appendix 6

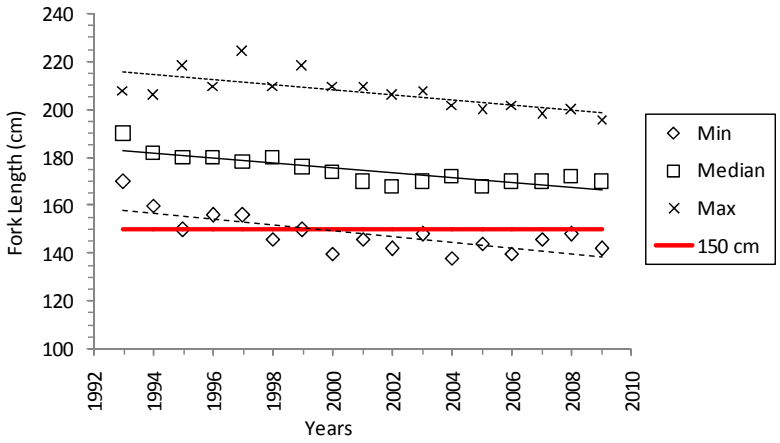


Figure 7. The annual range and median and linear tren of fork length of SBT at Benoa (1993 – 2009) Source: redrawn from Farley et al., (2010).

Table 4. List of by-catch species of tuna longliner landing at Benoa (Januari –June 2009).

No	Scientific names	English names	Indonesian names	Composition (%)
1	*Sphyraena* spp.	Baracuda	Barakuda	0.1
2	*Makaira indica*	Black Marlin	Setuhuk hitam	8.8
3	*Carcharinus falciformes*	Black Shark	Hiu hitam	+
4	*Makaira mazara*	Blue Marlin	Marlin biru	29.1
5	*Tetrapturus audax*	Stripped Marlin	Setuhuk loreng	0.8
6	*Lepidocybium* spp	Oil fish	Ikan setan	6.4
7	*Cololabis saira*	Saury	Sauri	+
8	*Istiophorus platypterus*	Sail fish	Ikan Layaran	2.2
9	*Carcharinus spp.*	Sharks	Hiu	+
10	*Katsowonus pelamis*	Skipjack	Cakalang	+
11	*Tetapturus angustrirostris*	Shortbill spearfish	Ikan todak	0.4
12	*Xiphias gladius*	Swordfish	Ikan pedang	37.8
13	*Acanthocybium solandri*	Wahoo	Waho	3.5
14	Others		Ikan lain	6.4

Source : Suprapto (2009)

Appendix 7

Table 5. List of by-catch species of tuna longliner by scientific observer during 2009

NO	LOCAL NAMES	TRADE NAMES	*SCIENTIFIC NAMES*	N	(%)
1	Bawal Sabit	Sickle Pomfret	*Taractichthys steindachneri*	1120	25.46
2	Gindara / Ikan Setan	Black Escolar	*Lepidocybium flavobrunneum*	464	10.55
3	Lamadang	Common Doplhin Fish	*Coryphaena hippurus*	57	1.30
4	Opah / Ikan Merah	Moon Fish	*Lampris guttatus*	23	0.52
5	Meka	Sword Fish	*Xiphias gladius*	269	6.12
6	Cakalang	Skipjack	*Katsuwonus pelamis*	44	1.00
7	Layur Hitam	Snake Mackerel	*Gempylus serpens*	6	0.14
8	Tenggiri	Wahoo	*Scomberomus guttatus*	70	1.59
9	Alu-alu	Baracuda	*Sphyraena barracuda*	45	1.02
10	Mambo	Sun Fish	*Mola mola*	10	0.23
11	Setuhuk Hitam	Black Marlin	*Makaira indica*	86	1.95
12	Setuhuk Biru	Blue Marlin	*Makaira mazara*	26	0.59
13	Setuhuk Paruh Pendek	Shortbill Spear Fish	*Tetrapturus angustirostris*	7	0.16
14	Setuhuk Loreng	Striped Marlin	*Tetrapturus audax*	9	0.20
15	Cucut Koboy	Oceanic Whitetip Shark	*Carcharhinus longimaus*	17	0.39
16	Cucut Selendang Biru	Blue Shark	*Prionace glauca*	61	1.39
17	Hiu Moro	Mako Shark	*Isurus oxyrinchus*	17	0.39
18	Cucut Buaya	Crocodile Shark	*Pseudocarcharhinus kamoharai*	9	0.20
19	Layaran	Sail Fish	*Istophorus platypterus*	44	1.00
20	Hiu Tikus	Bigeye Thresher Shark	*Alopias superciliosus*	2	0.05
21	Hiu Tikusan	Pelagic Thresher	*Alopias pelagicus*	1	0.02
22	Hiu Martil	Scalloped Hammerhead	*Sphyrna lewini*	1	0.02
23	Tongkol	Frigate Tuna	*Auxis thazard*	11	0.25
24	Ikan Naga	Lancet Fish	*Alepisaurus brevirostris*	>1000	>22.73
25	Pari Lumpur	Pelagic Stingray	*Dasyatis violacea*	>1000	>22.73

Source: Interim report of BTMS (2009)

Figure 9. Port of Benoa Bali (left) and typical long liner in Indian Ocean.
Source : Proctor, 2010 and Fayakun (2009)