

## TUNA LONGLINE LANDINGS IN PHUKET, THAILAND, FROM 1994 TO 2002<sup>1</sup>

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### ABSTRACT

*Since the start of the industrial purse seine and longline fishery landed at Phuket fishing in 1993 and in 1994 have expanded considerably in terms of catch, effort and CPUE. Landing surveys were made to collect fishing and biological data of tunas.*

*The annual landing and value of tunas at Phuket, Thailand varies from 1,750 mts and 1.88 million US\$ to 34,032 mts and 41.32 million US\$ during 1993 to 2001. The trend of catch and value from longliner was a slight increasing since 1994 (622 mts, 2.07 million US\$) to 2001 (4,280 mts, 12.07 million US\$). The marketing system and vessel information have reported in present study.*

*About 500 surface tuna longline fleets (Taiwanese, Chinese and Indonesian) have been recording at Phuket fishing port since 1994 to present. The highest total catch was found in 1999 (4,373 mts). Fishing ground occurred in the Eastern Indian Ocean when the productive period was pronounced in northeast monsoon. The catch of target species reported yellowfin, followed by bigeye, bill fish (Striped marlin (*Tetrapturus audax*), blue marlin (*Makaira mazara*), black marlin (*M. indica*), Indo-pacific sailfish (*Istiophorus platypterus*) and shortbill spearfish (*T. angustirostris*), swordfish (*Xiphias gladius*) and miscellaneous species (shark, *Molar spp.*, *Lepidocybium spp.*, *Coryphaena spp.*, *Scomberomorus spp.*, *Ruretlus pretiosus*, *Sphyræna spp.*, *Taractichtis spp.*, *Katsuwonus pelamis*). Taiwanese and Indonesian fleets caught the yellowfin as the main composition while bigeye was the main target species of Chinese fleet.*

### INTRODUCTION

Tuna fisheries in the Indian Ocean took off in 1973 when the French, Russian, Japanese and Taiwanese fleets commenced their longline, purse seine and pole-and-line fisheries. The Taiwanese, Chinese and Indonesian fleets have developed longline fishing techniques in recent years in the Eastern Indian Ocean. Large tuna fish caught by longline is highly profitable as its meat is suitable for making premium sashimi and in high demand in the Japanese markets. These vessels normally landed their catch in Singapore, Malaysia and Indonesia until 1994. Since then, they preferred to land their catches at the Phuket fishing port which has well developed infrastructures as the port and accessible to the international airport.

At the 1999 Indian Ocean Tuna Commission (IOTC) meeting, held in Kyoto (Japan), the implementation of sampling programmes in different ports of the Indian Ocean was strongly recommended, the primary objective being to monitor the activities of IUU (illegal, unregulated and

unreported) longliners operating in the Indian Ocean. Nine Indian Ocean ports were selected as primary targets for the implementation of sampling programmes, namely Benoa, Cilacap and Jakarta (Indonesia), Cape Town and Durban (South Africa), Pinang (Malaysia), Phuket (Thailand), Port Louis (Mauritius) and Singapore (Herrera *et al.*, 2000). Since then, IOTC has supported the Department of Fisheries (DOF) in implementing the Sampling Program on Tuna Longline Vessels Unloading in Phuket in April 2000. Under these circumstances, the objective of this study is to improve data collection on tuna longline fisheries in the East Indian Ocean as well as information on the activities, landing catches, catch breakdown by species caught by tuna longliners and unloaded in Phuket; which is considered to be important and is reviewed below.

### MATERIALS AND METHODS

Port-sampling and landing surveys were conducted to collect fishing and biological data of tuna, tuna-like and by-catch species: e.g., catch (metric ton, mt) and effort (number of

<sup>1</sup> This paper presented at the 4<sup>th</sup> Working party on Tropical Tunas, IOTC, held at Shanghai, Republic of China, 3 to 11 June 2002.

trips). They usually include information concerning the vessel (name, flag, and registration number), fishing ground, the vessel's agent, the dates of unloading, and the amount unloaded (processed weight in metric tonnes (mts) ) and value (in million US\$) by species from interview data, the shipping agencies, Fish Marketing Organize(FMO) and Customs in Phuket. The staff of the Andaman Sea Fisheries Development Center (AFDEC) conducted the samplings monthly at the Phuket fishing port since August 1994. In addition, the methodology employed and all the forms used in fishery interviews were provided by IOTC since April 2000.

Estimation of the number of landings in Phuket from August 1994 to March 2002: The number of landings per flag retrieved from the Customs in Phuket was used as basis for the calculation of the total catches unloaded in this port. These figures were compared with records provided by other organizations (FMO) or directly from the shipping agencies consigning the vessels. The overall number obtained once the landings from all sources put together showed much higher than those in the Customs records. The number of landings per flag could be assessed from AFDEC (document for Dolphin Safe Certificate) and Customs being the information available quite aggregated.

Landing catch, catch by species and effort and fishing ground were analyzed and illustrated by Excel, Access, ArchView and ILDDE(database program of IOTC) software.

## RESULT AND DISCUSSION

### Marketing system

Chart 1 illustrate the longline marketing system at Phuket during 2000-2001, skipper will recall and inform amount of fish and arrival date directly to the owner of fishing companies, 7 companies, before landing. The companies will contact to shipping agencies (3 agencies) for import permission from Thai Customs while the agencies will sent the documents of their vessels for request “Dolphin Save Certificate” from AFDEC before this document will sent again to Customs. Longliners unload at six processing plants in Phuket Province and one in Phang-nga Province where is graded, cleaned and packed for the export fish. Fish will sale to the Buyer Company (12 companies, some of them as import companies). There will export the most of tuna and small amount of bill fish and swordfish to the target market at Japan, follow by USA or Singapore via air plane. Export companies (10 companies) will organize for permission document. The reject fish is sold to local market or/and other buyers, loins packing companies (6 companies) and cold storage plant, where will produce the loins or frozen fish as add-valued for export again. Furthermore, some of import companies have more than one activity as shipping, buyer, packing, producer and exporter such as Phuket Dongher Trading and Thai Ocean Venture.

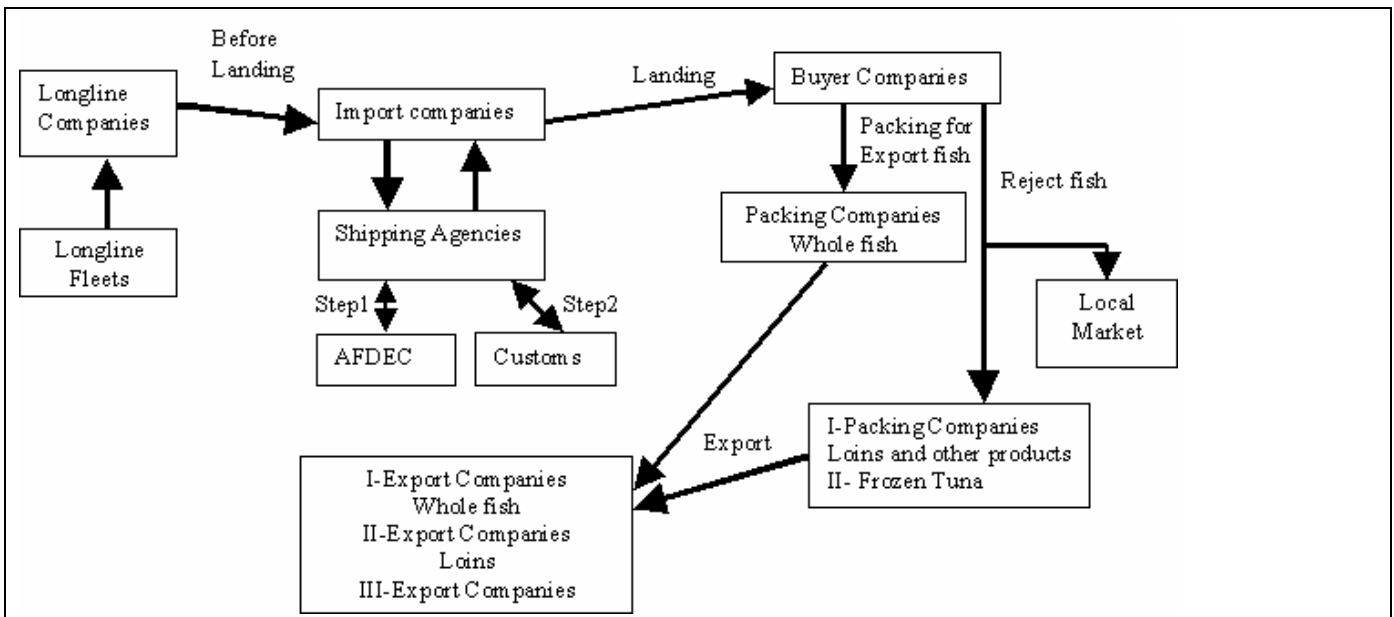


Chart 1 Longline marketing system in Phuket Province.

### Fisheries information

Number of longline fleets, and vessel and gear characteristic had reported by previous studies (Chantawong *et al.*, 1999; Nootmorn and Herrera, 2001) from 1994 to 2000. Table 1 show a summarized of vessel characteristic each fleet during 1994 to 2001. In 1994, 200 Taiwanese vessels started to unland at Phuket, followed by 20 Chinese vessels since 1996 and 17 Indonesian vessels since 1999. Monofilament were used for the line of their longliners. Number of hooks

ranged from 600 to 1,800 depending on the size of fishing boats, nationality and fishing condition. The average number of hooks per basket varied 5 to 6 while type of bait were live milk fish, frozen squid, frozen scad and saury. Whereas, the target species are usually stored in storage cold with ice located at front of vessel, others fish (e.g. skipjack, shark, miscellaneous species,..) are stored in the second hold behind the ship. Their fishing grounds were located from latitude 15° N to 6° S and longitude 78° to 96° E, the Eastern Indian Ocean (Fig. 1).

Table 1 Longline vessel and gear characteristic by nationality from 1994 to 2001. Symbol: CHN = Chinese, IDN=Indonesian, TWN=Taiwanese.

Vessel Interviews		GRT		LOA (m)		Fish CC (t)		Dist Buoys		No Hooks between Buoys			Total no Hooks			Average no Radio Buoys
Flag	Made of	Min	Max	Min	Max	Min	Max	Min	Max	Avg	Min	Max	Avg	Min	Max	
CHN	Wood/stell	35	160	25	33	8	110	280	455	5	4	9	1,015	600	1,400	8
IDN	Wood/fiber glass	120				40	40	168	168	6	4	9	1,200	1,200	1,200	9
TWN	Fiber glass/wood	19.8	65	24	38	8	9	60	120	5	4	6	1,427	800	1,800	10

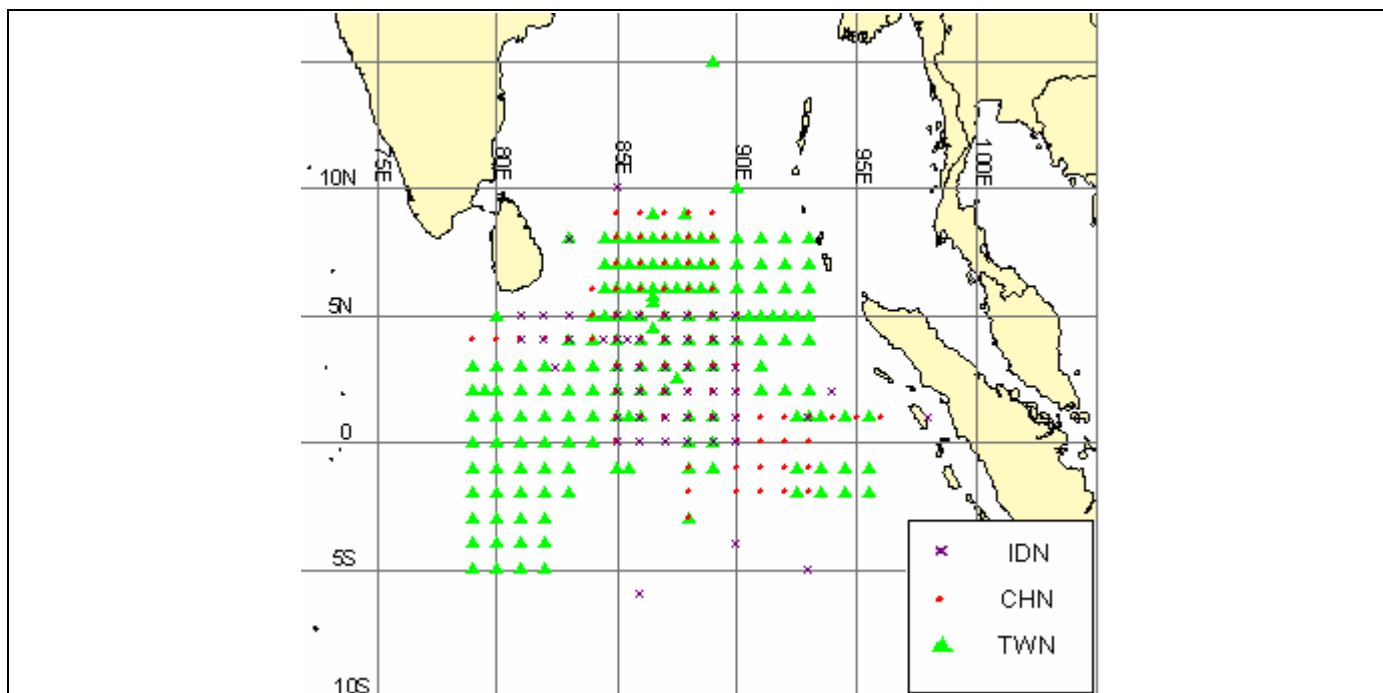


Fig. 1 Fishing ground of tuna longline fleets in the Eastern Indian Ocean. Symbol: CHN = Chinese, IDN=Indonesian, TWN=Taiwanese.

### Pattern of tuna landing and fishing effort

The total landings and value of tuna fisheries (purse seine and longline (processing weight)) during 1994 were estimated to be 25,108 mts and 26.36 million US\$. The main contribution of total landing in Phuket unloaded from purse seine fleets during 1994 to 2000. Since then, the longliners have represented 56 and 82 percent of total landings and total value, respectively, in 2001. The trend of longline landings and value showed a slight increase from 1994 to 2001 (Nootmorn *et al.*, 2002).

Total landing and effort of longliner showed the increasing trend during 1994 (622 mts and 72 trips) to 2001 (4,280 mts and 856 trip) while CPUE trend was slight increasing from 1999 (4.95 mts/trip) to 2002 (5.14 mts/trip) (Fig. 2). In addition, trend of total number of longliners was increased from 1994 (66 vessels) to 2002 (280 vessels), the highest peak showed in 2001 (297 vessels). Taiwanese fleet share the main proportion (55-100% of total number of vessel) as first fleet unloaded at Phuket since 1994, followed by Chinese vessels (15-37 %) since 1996 and Indonesian fleet (7-12 %) since 1999 (Fig. 3).

The main target species is yellowfin (50 %), bigeye (31 %), bill fish (Striped marlin (*Tetrapturus audax*), blue marlin (*Makaira mazara*), black marlin (*M. indica*), Indo-pacific sailfish (*Istiophorus platypterus*) and shortbill spearfish (*T.*

*angustirostris*) (9%), swordfish (*Xiphias gladius*) (9 %) and miscellaneous species (shark, *Molar* spp., *Lepidocybium* spp., *Coryphaena* spp., *Scomberomorus* spp., *Ruretlus pretiosus*, *Sphyraena* spp., *Taractichtis* spp., *Katsuwonus pelamis*) (1%) from 1994 to 2002 (Table 2). The production peaks of yellowfin and bigeye showed during October to May (northeast monsoon), while albacore and skipjack barely recorded and found only in May and October, and September to December, respectively. In addition, Blue marlin, Striped marlin and Indo-pacific sailfish had peak in April to May and October to December; Black marlin in April, August, October to December; Shortbill spearfish in October.

Fig. 4 show the landing catches of longliner by species from 1994 to 2001, the composition of bigeye show increasingly, especially in 1999 to 2001. During this period, number of Chinese vessels increased from 45 in 1999 to 105 in 2001, bigeye was the main target species by Chinese longliner (Herrera *et al.*, 2000). The total monthly variations of CPUE, catch and fishing effort during August in 1994 to March in 2002 reported in Fig. 5, catch and effort showed the highest peak in 2000. Trend of monthly catch was at similar levels from 1995 to 1999 while the increasing in fishing effort found during this period, then, the CPUE trend indicated declination. The peak season of longliner is at the arrival of the northeast monsoon.

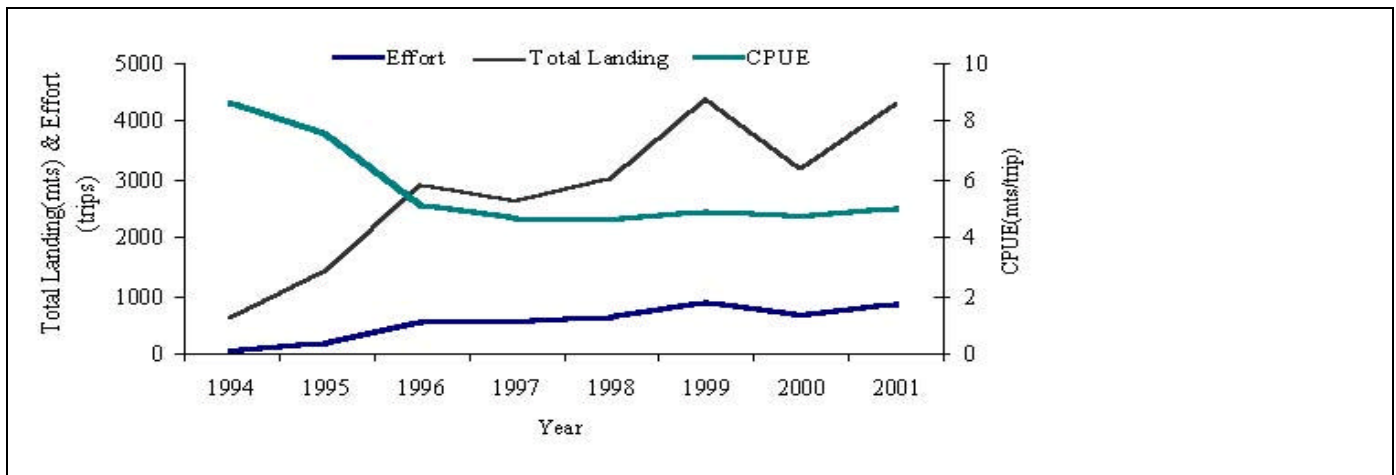


Fig. 2 Change of total landing (mts), fishing effort (trips) and CPUE (mts/trip) of longliner, 1994 to 2001.

Table 2 Fishing effort (no. of trip), catch (mts) and CPUE (mts/trip) by longliner landed at Phuket Province from 1994 to 2002.

Symbol: ' - ' = no data, ' \* ' = miscellaneous,

YF=yellowfin, BE=bigeye, BILL=bill fish, SWO=swordfish, SHA=shark.

Year	Effort	Total	YF	BE	BILL	SWO	SHA	CPUE	Remark
1994	72	622	254	127	56	66	20	8.64	Aug-Dec
1995	187	1,415	958	200	133	113	13	7.57	Jan-Dec
1996	567	2,903	1,038	965	426	425	49	5.12	Jan-Dec
1997	558	2,632	1,138	676	425	383	10	4.72	Jan-Dec
1998	655	3,015	2,435	432	84	63	1	4.60	Jan-Dec
1999	883	4,373	2,124	1,909	200	140	1	4.95	Jan-Dec
2000	665	3,118	1,310	1,244	247	209	108	4.69	Jan-Dec
2001	856	4,280	1,846	1,359	519	490	66*	5.00	Jan-Dec
2002	355	1,872	719	997	88	46	22*	5.27	Jan-Mar

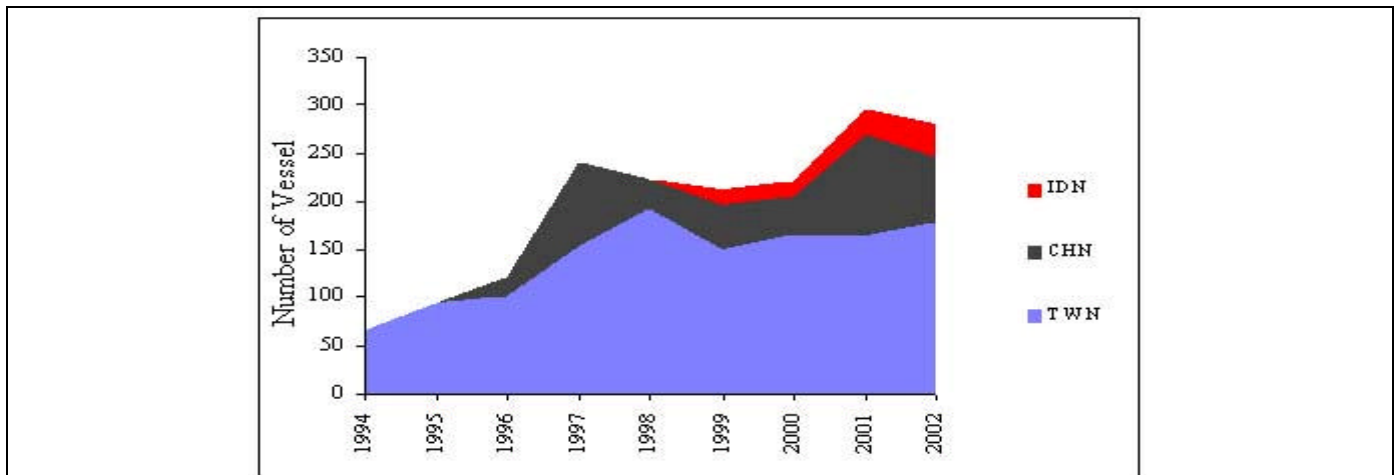


Fig. 3 Number of longline vessels by nationality, 1994 to 2002.

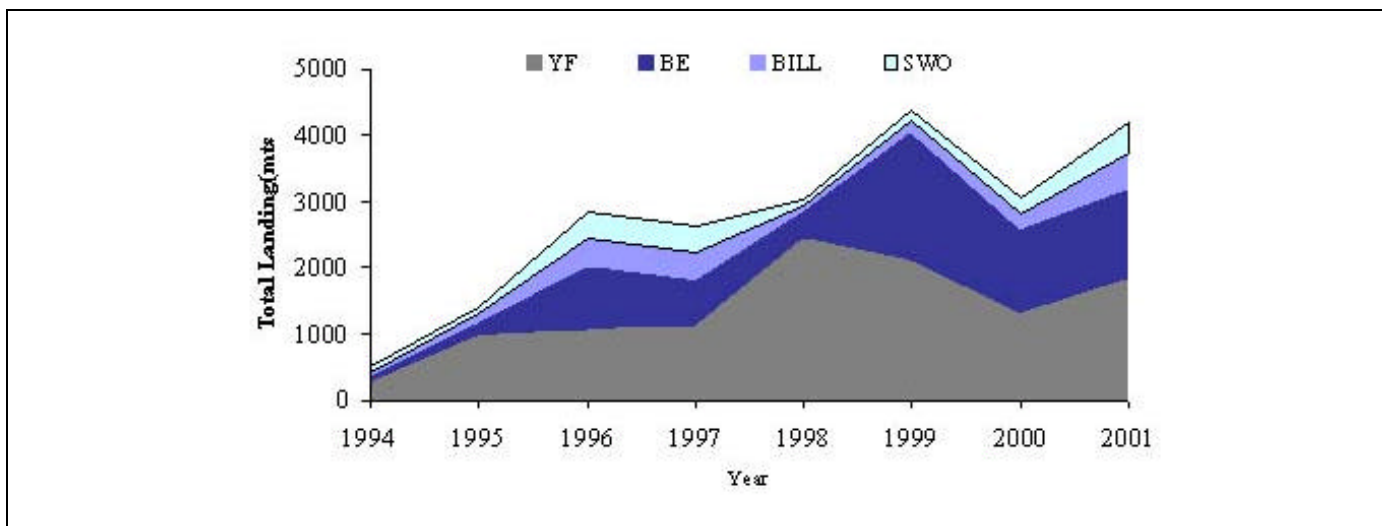


Fig. 4 Landing catches by species group of longliner, 1994 to 2001.

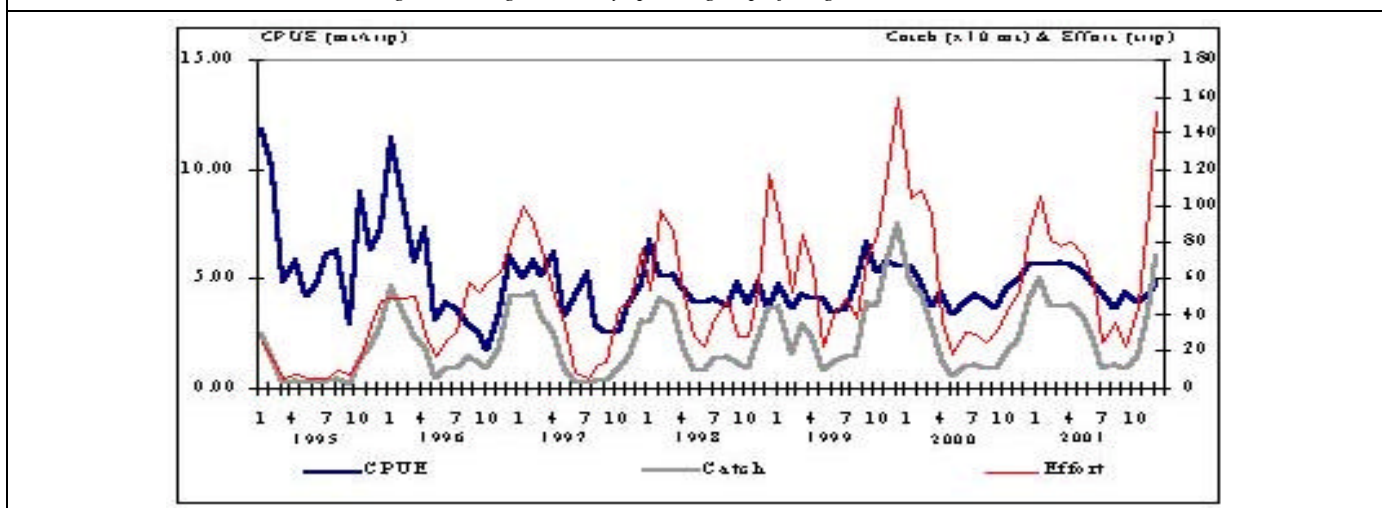


Fig. 5 Changes of CPUE (mts/trip), catch (mts) and fishing effort (trip) of longline fleets from 1995 to 2001.

Table 3 presented catch and effort statistics by each vessel nationality (Taiwanese, Chinese, Indonesian and Taiwanese-Indonesian) during January in 2000 to March in 2002. It is important to note at this stage that vessels flying two different flags have been reported from Dolphin Save Certificate, skipper reported alternately between Taiwanese and Indonesian flags during landing at Phuket. Catch rate of Taiwanese longliner showed higher than Chinese longliner while catch rate of Indonesian longliner was the highest variation (2 to 8.25 mts/trip), whereas some of Indonesian fleet have another fishing activity as carrier vessel. Another reason regarding high catch of Taiwanese and Indonesian longliner was the fishing day of these fleets that were about 25 to 35 days and 20 to 25 days, respectively, and operation time was all of day (day and night time). Whereas Chinese longliner has fishing day was 10 to 20 days and operated only in day or night time. Fig. 6 showed species composition from each vessel nationality which yellowfin tuna is the main composition of Taiwanese, Indonesian and Taiwanese-Indonesian longliner, followed by bigeye tuna, swordfish and billfish, respectively. Chinese fleet caught bigeye tuna is main target, followed by yellowfin tuna, bill

fish, sword fish and others species. The reason was operating time, mostly Chinese fleet operated during full moon phase (Herrera *et al.*, 2000), and types of bait, Chinese fleet used only frozen squid while other fleets used frozen squid, live milkfish and saury fish.

## CONCLUSION

Since the start of the industrial purse seine fishery landed at Phuket deep-sea port in December 1993 and the start of conventional longline fishery unloaded at Phuket fishing port in August 1994 have expanded considerably in terms of catch, effort and CPUE. Landing surveys were made to collect fishing and biological data of tunas.

The marketing system of tuna business at Phuket have many stakeholder deal with their product such as fishermen, vessel companies, importer, shipping agency, government organizations (AFDEC and Customs), buyer (local buyer and companies), packing companies, cold storage plants, exporter. In this case, all of stakeholders provide available information data regarding tuna and other production (process from tuna, billfish and swordfish) that will be

useful and valued for the certain estimation of landing catch of tuna caught by longline at Phuket.

The annual landing and value of tunas at Phuket, Thailand varies from 1,750 mts and 1.88 million US\$ to 34,032 mts and 41.32 million US\$ during 1993 to 1998. The trends of longline catch and value were a slight increase during 1994 to 2001, where have been the percentage of landing and value to be 3 to 57 and 7 to 82 of total landing and total value.

About 500 tuna longline vessels of Taiwanese, Chinese and Indonesian had recorded to unload at Phuket fishing port since 1994 to present. The fishing ground of this fleets distribute in the Eastern Indian Ocean. The highest total catch was recorded in 1999 (4,373 mts). Trend of monthly catch was a same level from 1995 to 1999 with the increases in fishing effort but the decrease in CPUE. The productive duration with a high peak of catch was pronounced in northeast monsoon. The catch of target species was primarily yellowfin (50 %), followed by bigeye tuna (31 %), bill fish (9 %), swordfish (9%), and other species (1 %). The composition of catch showed a decreasing trend in yellowfin tuna from 1995 to 1996 and 2000, while an increasing trend were observed in bigeye tuna, bill fish and swordfish. An increasing trend of yellowfin catch showed again during 1997 to 1998 and 2001.

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Regarding, catch indices (catch, effort and CPUE) by nationality can plot out Taiwanese fleet that is the highest efficiency than Chinese and Indonesian fleets, their has more special skill than those fleets. Yellowfin is the main target of Taiwanese and Indonesian vessels while bigeye is the main component by Chinese longliner.

## PROBLEMS ENCOUNTERED AND RECOMMENDATION

However, it seems to have some problems in connection with data collection and statistics these include.

1. The lack of logsheet of foreigner longliner unloaded at Phuket fishing port, only the interview data have been taken from the export company and master fishermen. Then, the data collection system of longliner has to be better established, so that all data users (such as the IOTC) researcher and fishermen may be satisfied.
2. The data collection and statistics address of tuna and billfish should have cooperated between the nation fleet and the nation port have been unloaded or transshipped (such as logsheet for foreigner tuna purse seine and lonliner fisheries in the Eastern Indian Ocean).

Table 3 Fishing effort (no.of trip), catch (mts) and CPUE (mts/trip) by longliner landed at Phuket Province during Jan 2000 to Mar 2002.

Symbol: ' - ' = no data, BE=bigeye, YF=yellowfin, MAR=bill fish, SWO=swordfish, MSC=Fish Nei (shark, *Molar* spp., *Ruretlus pretiosus*, *Sphyaena* spp., *Taractichtis* spp.)

**Taiwanese:**

Year	Month	effort	Total	TUNA	BE	YF	MAR	SWO	MSC	CPUE
2000	Jan	84	484	445	299	146	24	15	0	5.76
	Feb	86	431	396	209	187	21	14	0	5.01
	Mar	64	248	234	167	67	6	7	1	3.87
	Apr	16	84	71	36	35	8	4	1	5.25
	May	8	29	20	12	8	5	2	2	3.59
	Jun	15	70	46	23	23	15	9	0	4.63
	Jul	16	79	50	21	29	9	11	9	4.94
	Aug	8	41	31	13	18	3	3	4	5.13
	Sep	12	53	34	12	22	6	9	4	4.42
	Oct	20	108	95	11	84	1	11	1	5.40
	Nov	39	223	142	37	105	30	27	24	5.72
	Dec	71	435	337	60	277	39	32	27	6.13
	<b>Total</b>		<b>439</b>	<b>2,285</b>	<b>1,901</b>	<b>900</b>	<b>1,001</b>	<b>167</b>	<b>144</b>	<b>73</b>
2001	Jan	81	474	304	64	240	66	86	18	5.85
	Feb	64	352	276	99	177	27	49	0	5.50
	Mar	45	264	195	77	118	31	37	1	5.87
	Apr	37	256	153	66	87	42	60	1	6.94
	May	23	140	109	56	53	20	11	0	6.06
	Jun	22	143	121	73	48	11	8	3	6.49
	Jul	7	63	59	29	30	1	1	2	9.12
	Aug	14	72	61	26	35	7	4	0	5.14
	Sep	15	82	47	18	29	9	24	2	5.47
	Oct	23	118	93	58	35	14	7	4	5.13
	Nov	64	303	255	86	169	35	11	2	4.73
	Dec	107	535	432	195	237	55	45	3	5.00
	<b>Total</b>		<b>502</b>	<b>2,802</b>	<b>2,105</b>	<b>847</b>	<b>1,258</b>	<b>318</b>	<b>343</b>	<b>36</b>
2002	Jan	54	296	263	167	96	16	8	9	5.48
	Feb	93	429	399	193	206	18	12	0	4.61
	Mar	57	428	400	207	193	18	9	1	7.51
	<b>Total</b>		<b>204</b>	<b>1,153</b>	<b>1,062</b>	<b>567</b>	<b>495</b>	<b>52</b>	<b>29</b>	<b>10</b>

Chinese:

Year	Month	Effort	Total	TUNA	BE	YF	MAR	SWO	MSC	CPUE
2000	Jan	20	99	91	61	30	5	3	0	4.94
	Feb	23	100	91	48	43	6	3	0	4.36
	Mar	31	105	102	73	29	2	1	0	3.39
	Apr	14	63	53	30	23	5	3	2	4.50
	May	10	28	24	15	9	1	1	2	2.80
	Jun	15	51	28	19	9	9	8	6	3.40
	Jul	11	38	21	10	11	5	7	5	3.45
	Aug	15	51	38	16	22	4	4	5	3.40
	Sep	17	56	39	14	25	5	8	4	3.29
	Oct	20	74	45	14	31	15	13	1	3.70
	Nov	13	36	29	14	15	3	1	3	2.77
	Dec	10	37	20	4	16	14	1	2	3.70
	<b>Total</b>		<b>200</b>	<b>738</b>	<b>581</b>	<b>318</b>	<b>263</b>	<b>74</b>	<b>53</b>	<b>30</b>
2001	Jan	13	41	25	6	19	6	8	2	3.15
	Feb	10	43	27	9	18	8	8	0	4.30
	Mar	20	91	71	36	35	8	11	1	4.55
	Apr	31	111	89	57	32	16	4	2	3.58
	May	42	203	130	73	57	38	27	8	4.83
	Jun	25	84	66	44	22	12	4	2	3.37
	Jul	16	40	32	23	9	2	4	2	2.53
	Aug	19	48	35	17	18	8	5	0	2.53
	Sep	5	12	9	3	6	1	2	0	2.40
	Oct	17	50	34	20	14	8	5	3	2.94
	Nov	31	104	78	38	40	19	5	2	3.35
	Dec	29	91	72	45	27	10	9	0	3.14
	<b>Total</b>		<b>258</b>	<b>918</b>	<b>668</b>	<b>371</b>	<b>297</b>	<b>136</b>	<b>92</b>	<b>22</b>
2002	Jan	9	31	28	23	5	1	1	1	3.44
	Feb	21	82	77	59	18	3	2	0	3.90
	Mar	32	129	119	83	36	6	4	0	4.03
	<b>Total</b>		<b>62</b>	<b>242</b>	<b>224</b>	<b>165</b>	<b>59</b>	<b>10</b>	<b>7</b>	<b>1</b>



**Indonesian:**

Year	Month	Effort	Total	Tuna	BET	YFT	MAR	SWO	MSC	CPUE
2000	Jan	0	0	0	0	0	0	0	0	0
	Feb	0	0	0	0	0	0	0	0	0
	Mar	1	5	5	4	1	0	0	0	5
	Apr	7	15	13	4	9	1	1	0	2.14
	May	1	8	5	4	1	1	1	1	8
	Jun	1	2	2	1	1	0	0	0	2
	Jul	3	11	7	3	4	1	2	1	3.67
	Aug	2	9	7	3	4	0	1	1	4.5
	Sep	2	4	3	1	2	0	1	0	2
	Oct	2	10	7	1	6	1	2	0	5
	Nov	2	12	9	1	8	1	1	1	6
	Dec	6	19	14	4	10	1	3	1	3.17
	<b>Total</b>	<b>27</b>	<b>95</b>	<b>72</b>	<b>26</b>	<b>46</b>	<b>6</b>	<b>12</b>	<b>5</b>	<b>3.52</b>
2001	Jan	12	87	64	13	51	10	10	3	7.25
	Feb	8	66	59	11	48	2	4	1	8.25
	Mar	13	91	63	16	47	12	16	0	7
	Apr	5	38	30	9	21	4	3	1	7.6
	May	1	2	2	1	1	0	0	0	2
	Jun	3	10	8	4	4	1	1	0	3.33
	Jul	2	8	7	4	3	0	1	0	4
	Aug	2	6	5	2	3	1	0	0	3
	Sep	3	6	5	2	3	1	0	0	2
	Oct	5	10	8	4	4	2	0	0	2
	Nov	2	6	4	1	3	2	0	0	3
	Dec	13	84	64	38	26	13	7	0	6.46
	<b>Total</b>	<b>69</b>	<b>414</b>	<b>319</b>	<b>105</b>	<b>214</b>	<b>48</b>	<b>42</b>	<b>5</b>	<b>6</b>
2002	Jan	6	23	20	12	8	1	2	0	3.83
	Feb	7	27	26	10	16	1	0	0	3.86
	Mar	7	47	44	22	22	2	1	0	6.71
	<b>Total</b>	<b>20</b>	<b>97</b>	<b>90</b>	<b>44</b>	<b>46</b>	<b>4</b>	<b>3</b>	<b>0</b>	<b>4.85</b>

**Taiwanese and Indonesian Fleet:**

Year	Month	Effort	Total	TUNA	BE	YF	MAR	SWO	MSC	CPUE
2001	Jan	0	0	0	0	0	0	0	0	0
	Feb	0	0	0	0	0	0	0	0	0
	Mar	0	0	0	0	0	0	0	0	0
	Apr	7	49	35	10	25	6	7	1	7
	May	7	43	33	9	24	6	3	1	6.14
	Jun	6	25	21	10	11	2	1	1	4.17
	Jul	0	0	0	0	0	0	0	0	0
	Aug	1	4	4	0	4	0	0	0	4
	Sep	0	0	0	0	0	0	0	0	0
	Oct	0	0	0	0	0	0	0	0	0
	Nov	2	7	4	2	2	2	1	0	3.5
	Dec	4	18	16	5	11	1	1	0	4.5
	<b>Total</b>	<b>27</b>	<b>146</b>	<b>113</b>	<b>36</b>	<b>77</b>	<b>17</b>	<b>13</b>	<b>3</b>	<b>5.41</b>
2002	Jan	3	8	7	5	2	1	0	0	2.67
	Feb	4	8	8	4	4	0	0	0	2.00
	Mar	3	12	11	6	5	1	0	0	4.00
	<b>Total</b>	<b>10</b>	<b>28</b>	<b>26</b>	<b>15</b>	<b>11</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>2.80</b>

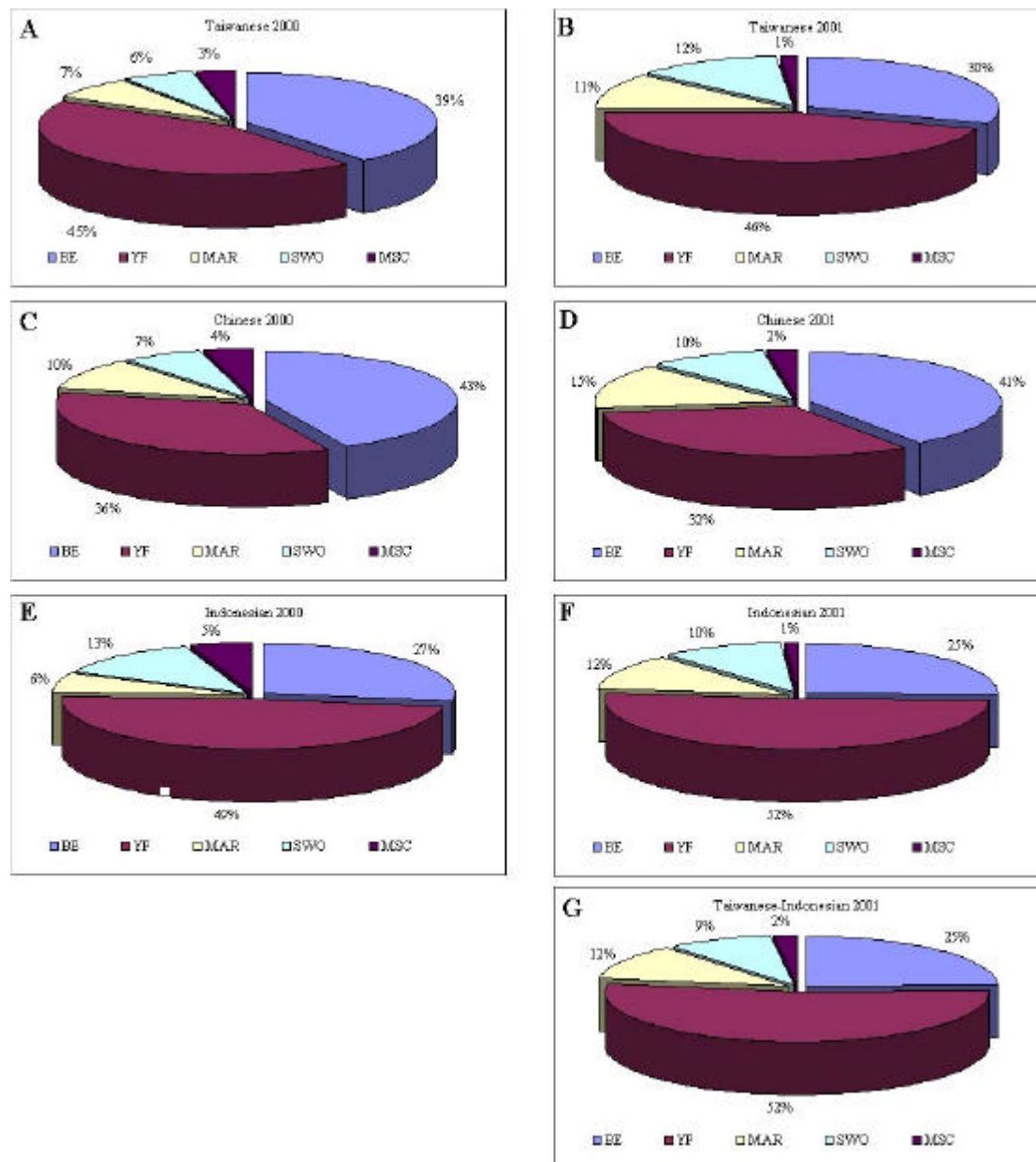


Fig. 6 Species composition by country fleets (A,B = Taiwanese fleet; C,D = Chinese fleet; E,F = Indonesian fleet; G = Taiwanese-Indonesian fleet) in 2000 and 2001.

Symbol: BE=bigeye, YF=yellowfin, MAR = billfish, SWO=swordfish, MSC=Fish Nei (shark, *Molar spp.*, *Ruretlus pretiosus*, *Sphyrna spp.*, *Taractichtis spp.*)