

THE REPORT ON BASELINE SURVEY ON FISHING EFFORT AND LANDING IN THE SOUTHWESTERN GULF OF THAILAND

UNDER “STRENGTHENING MALAYSIAN AND THAI PARTNERSHIP IN SUPPORT
OF JOINT FISHERIES PLANNING AND MANAGEMENT
IN THE WESTERN GULF OF THAILAND”



TRAINING DEPARTMENT
Southeast Asian Fisheries Development Center
September 2016

TD/RP/189

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SUPPORT OF JOINT FISHERIES PLANNING AND MANAGEMENT
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Collaboration with

Marine Fishery Resources Development and Management Department

Department of Fisheries, Thailand

Department of Fisheries, Malaysia



TRAINING DEPARTMENT

SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER

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EXECUTIVE SUMMARY

A baseline survey on fishing efforts and landing in the Southwestern Gulf of Thailand is an activity under the title of “Strengthening Malaysian and Thai Partnership in support of Joint Fisheries Planning and Management in the Western Gulf of Thailand” which was implemented from July 2014 to December 2015. Its aim is to gather preliminary information on fishing efforts (vessels, gear, and people) and landing of catch, which would be used as basis to improve the monitoring and control of fishing activities. In addition, the survey hopes to serve as a medium through local teams can participate, thus strengthening the cooperation between Thailand and Malaysia.

Designed by teams from both countries, the questionnaire on baseline survey covers important information on vessels name, vessels registration number, vessels owner name, specification symbol of vessels, type of vessels, port of registry, size of vessels, engine power, VMS system in the vessels, fishing area, nationality of vessels, history of vessels, nationality of captain/ master, number and nationality of crew through fishing operation and fish landing information such as fishing operation, major target species, landing port, and supply. The targeted area for the survey consists of three provinces in Thailand: Pattani, Songkhla, and Narathiwat; and three states in Malaysia: Kelantan, Terengganu, and Pahang. These areas were selected due to their close proximity to the border, opening the possibility of having a joint venture fishing arrangement between both countries. The actual total number of questionnaire from survey in Thailand and Malaysia is 409 and 459 samples respectively.

The first level of data analysis is summary feedbacks from the questionnaires conducted by two countries from April to September 2015. The baseline survey found that most of the fishing vessels in Thailand is purse seiner (51.84%), while in Malaysia is trawler (71.77%). There were only 96.09% of fishing vessels who were officially registered in Thailand. This contrasts the statistics of Malaysia: all fishing vessels were registered in their country. Most of the length of fishing vessels in both countries lies in the interval 18 to 23.99 meters, and engine size in 220 to 499 Hp. Most of fishing vessels in Thailand (98%) and Malaysia (96%) operate in their respective waters. In regards to nationality of captain/master fisherman in Thailand, most of them are Thai, while the nationality of crews is Cambodian, Burmese, Thai, and Lao. In Malaysia, the most common nationality of captain/ master fisherman is Malaysian, while the nationality of crews consists of Thai, Malaysian, Vietnamese, Cambodian, Lao, and Burmese. For fish landing, most of Thai fishing vessels are landing in Thai fishing port (98%) and all of Malaysian fishing vessels are landing in Malaysian fishing port. Supplies, such as ice, fuel, provision, general vessels maintenance, and fishing equipment were bought from their countries. Vessel Monitoring System (VMS) was installed to Thai and Malaysian fishing vessels about 16.53% and 36.17% respectively. In Malaysia only Zone C2 fishing vessel were installed with VMS. The highest total catches in Thailand are purse seine (72.78%), trawler (12.46%) and fish trap (4.14%). Whereas in Malaysia, highest catch is trawler (54.30%), followed by purse seine (45.37%) and fish trap (0.13%).

The second level of data analysis is an advance examination into illegal fishing vessels. It uses information from the questionnaire, such as: port of survey, number of vessels at specific port, specification of vessels (color of super structure, name and ID number, port register, type of fishing gear), previous name and nationality of flag, area of fishing/landing, number of crew and nationality, nationality of captain, number of working days at sea/month, fuel consumption, source of provision and supply. Assumption of IUU fishing vessels from baseline survey is 12.41%. Most of illegal fishing vessels are purse seine. Most of illegal fishing vessels length is 18-23.99 meters, with an average of 16.3 meters and weight 30 GT and over. However, in the same period of baseline survey, Thailand implemented Port in- Port out Control (PIPO) system to combat the IUU fishing vessels. In regards to this system, the fishing vessels weight 30 GT and over have the responsibility of implementing this system. According to this system, the fishing vessels less than 30 GT should be watchdog because it is easy to enter the illegal fishing operation.

Recommendations and suggestions to improve the planning, development, and management of fishing effort, and monitoring of landing in Malaysia and Thailand Sub-region are given as follow:

1. Establish a Memorandum of Understanding (MoU) between Malaysia and Thailand through landing information dissemination that covers the area of Songkhla Province, Pattani Province, Narathiwat Province in Thailand and Kelantan, Terengganu and Pahang in Malaysia;
2. Identify and appoint a National Coordinator, who will oversee the exchange of landing information;
3. Promote the improvement of fishing effort management in close cooperation between local authorities nearby boundary;
4. Encourage and emphasize the need for vessels marking inspection, in accordance with national regulation;
5. Consider and develop tools for fishing vessels less than 24 meters in length to reduce illegal fishing activities;
6. Encourage the usage of information from VMS for validation of fishing ground;
7. Expand research: baseline survey activity should not only be considered for commercial fishing vessels, but also for small-scale fishing vessels. The results of baseline survey will be used as information for planning and development of activities to improve management of fishing effort and monitoring landing in Sub-region.

INTRODUCTION

Fisheries products have been an important source of food for people all around the world. In the same manner, fishing and related activities have been a major provider of employment and economic benefits to those engaged in fisheries, fish processing and trade. The importance of fish and fishery products are more significant in Southeast Asia than in many other parts of the world. However, growing demand for fisheries products within and outside of the region has been met with sharp increases in fishing capacity. The large amount of vessels operating in the region, together with more efficient fishing gear, has led to a heavy pressure on resources and habitats of all the sub-regional seas of Southeast Asia. The Gulf of Thailand is among the most heavily fished areas.

Excessive fishing capacity and over-exploitation of limited fisheries resources in the Gulf of Thailand are not primarily caused by small scale fishermen. It is predominantly due to the larger fishing vessels, operating in the Gulf of Thailand and encroaching into near coastal waters that are inside areas reserved for traditional/coastal fisheries. Moreover, the usage of destructive fishing gears and fishing practices, conflicts between the various users, and obsolete regulatory systems for fisheries and utilization of aquatic resources are other key factors behind the severe deterioration of fisheries resources and important habitats that prevail in the Gulf of Thailand. Conflicts and/or irregular practices between countries (such as between Malaysia and Thailand) in bordering areas around the Gulf of Thailand are also evident countries whereby fishing vessels are encroaching into the waters of neighboring countries, landing of catches are made across boundaries and frequent incidences of double flagging is reported which adds to the need to improve fisheries management.

It has been realized in the region that living aquatic resources, although renewable, are not infinite and need to be properly managed if their contribution to the nutritional, economic and social wellbeing of the growing Southeast Asian population is to be sustained. Government officers and policy makers have, over the years, been concerned on manners and conditions of the current utilization of fisheries resources. Consequently, they have called for urgent actions to rectify fisheries practices toward sustainable development goals and the improvement of management practices, but so far with limited results. The ethos of the ASEAN Economic Community Blueprint and the ASEAN Socio-Cultural Community Blueprint emphasizes the importance of fisheries as a medium for improving the social well-being and rights of migratory (fish) workers. It also includes a call for the combat against illegal fishing.

Policy dialogue and promotion of regional cooperation on fisheries management are very important “keys” for long-term sustainability of fisheries and habitats in the Gulf of Thailand, and Southeast Asia as a whole. Regional cooperation around sub-regional seas, such as the Gulf of Thailand, is crucial bearing in mind that aquatic resources, fisheries including the people involved in the industry are very mobile and “trans-boundary” in nature. The SEAFDEC Secretariat, with the support from the SEAFDEC-Sweden

project, has already initiated a series of four meetings in order to facilitate sub-regional cooperation among the Gulf of Thailand countries. The events have been organized with the ambition of strengthening cooperation among the four countries around the Gulf of Thailand (Cambodia, Malaysia, Thailand and Vietnam), specifically regarding the integration of fisheries and habitat management, the efforts to manage fishing-capacity (reducing over-capacity), the need to monitor landings across boundaries, and the urgency to combat illegal and destructive fishing. The 4th Gulf of Thailand Meeting recommended that a sequence of bi-lateral “round-table” discussions should be held with Cambodia-Vietnam, Cambodia-Thailand and Malaysia-Thailand.

The first Sub-Regional Technical Meeting on Effective Fisheries Management between Malaysia and Thailand, which convened on 14-15 May 2014 in Penang, Malaysia, was facilitated by SEAFDEC and supported by the SEAFDEC-Sweden Project. During Meeting, a range of issues of common concerns from Malaysia and Thailand were discussed. Topics included, but are not limited to: the needs to promote effective management of fishing capacity; to combat illegal, unreported, and unregulated (IUU) and destructive fishing; and to facilitate cooperation on the management of trans-boundary fish stocks in the waters bordering Malaysia and Thailand in the Gulf of Thailand. The Meeting also discussed the procedures for fishing vessels registration and deregistration, fishing licensing and rules regarding landing of catches by foreign fishing vessels.

According to strengthen the collaboration between DOF Malaysia, DOF Thailand and other relevant agencies, and important recommendation from the said meeting was to explore options to enhance the communication between the two countries on matters related to fisheries. Consensus agreed that the topics of information sharing should focus on the need to improve control systems for the management of fishing capacity, control of registration and de-registration of fishing vessels, verification of the authenticity of the fishing licenses, and validation of the catch and landing documents (by local and foreign vessels).

During the Meeting, SEAFDEC/TD proposed to conduct a baseline survey on fishing effort and landing in the Southwestern Gulf of Thailand, under the title of “Strengthening Malaysian and Thai Partnership in support of Joint Fisheries Planning and Management in the Western Gulf of Thailand.” This activity is aimed at gathering preliminary information on fishing effort (vessels, gear, and people) and landing of catch, which would then be used as basis to improve the monitoring and control of fishing activities, as well as to strengthen the cooperation between Malaysia and Thailand by involving local teams.

I) OBJECTIVES

- To gather information on fishing effort (vessels, gear and people) in areas of common interest to Malaysia and Thailand
- To gather information on fish that are being landed by Malaysian and Thai vessels in fishing ports along the Gulf of Thailand coast

II) EXPECTED OUTPUTS

- Available information on fishing efforts (vessels, gear and people) in area of

- common interest to Malaysia and Thailand
- Available information on fish that are being landed by Malaysian and Thai vessels in fishing port along the Gulf of Thailand coast
- Recommendations and suggestions to improve the planning, development, and management of fishing effort, and monitoring of landing in Malaysia and Thailand

III) EXPECTED OUTCOMES

- Cooperation between Sub-region to improve the control and monitoring of fishing effort and fish landing in the Southwestern Gulf of Thailand

IV) METHODOLOGY

Period of activities implementation

July 2014 to December 2015

Establishment of working team

The working team from Malaysia (3 persons from the Department of Fisheries and 3 persons from the Fisheries Development Authority of Malaysia) and Thailand (6 persons from the Department of Fisheries and 3 persons from Fish Marketing Organization) through SEAFDEC/TD (7 persons) and SEAFDEC/MFRDMD (5 persons) was established to conduct the baseline survey which facilitated by SEAFDEC/TD and SEAFDEC/MFRDMD in areas of common interest to Malaysia and Thailand.

Design of questionnaire

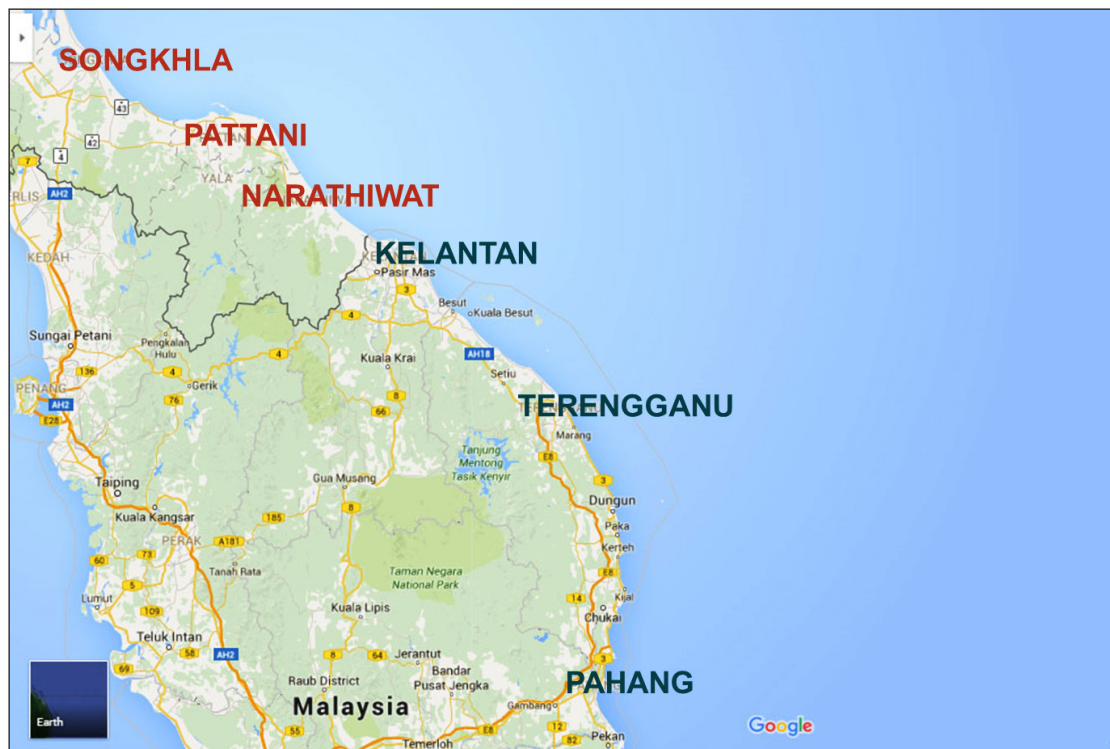
The questionnaire of baseline survey, on fishing effort and landing in the Southwestern Gulf of Thailand, is designed by the working team. The questionnaire is separated to two parts. The first part covers vessels information, such as: vessels name, vessels registration number, vessels owner name, specification symbol of vessels, type of vessels, port of registry, size of vessels, engine power, VMS system in the vessels, fishing area, nationality of vessels, history of vessels, nationality of captain/ master, number and nationality of crew. The second part covers fishing operation and fish landing information such as: fishing operation, major target species, landing port, and supply.

Components of the targeted group sample

The interview component targeted a group of vessels owner or captain/master of the fishing vessels, such as trawlers, purse seiners, fish traps, fish carrier and others

Target area

The target area for survey is identified as follows: three (3) provinces in Thailand namely Pattani, Songkhla, and Narathiwat, and (7) landing sites in the three (3) states such as Kelantan (Tok Bali and Geting); Terengganu (Pulau Kambing, Chendering, and Besut); and Pahang (Kuantan and Rompin) which considering its location near the border and possibility of having joint venture fishing arrangements between both countries.



Size of the sampled group

The working team agreed that at least 80% of the registered fishing vessels, that falls under the selected category and lands at the identified landing sites, would be sampled for data collection. The working team decided to focus on trawlers, purse seiners, and fish traps. In Thailand, each element was categorized by fishing vessels varying in length from 16 to 24 meters and over. In Malaysia, they were distinguished by C and C2 operation zones, consisting of fishing vessels above 40 GRT, which may have higher possibilities to travel out of Malaysian waters. The survey would be carried out by a one-off mannered questionnaire on fishing vessels that falls under the said category, which lands at the selected landing sites.

Table 1: Total number of Thai fishing vessels in each target province categorize by length

<i>Province</i>	<i>Number of fishing vessels by length</i>			
	<i>14.00-18.00 (m)</i>	<i>18.01-25.00 (m)</i>	<i>>25.00 (m)</i>	<i>Total</i>
Songkhla	197	173	11	381
Pattani	184	341	20	545
Narathiwat	40	2	-	42

Source: Thai Fishing Vessels Statistic 2013

Table 2: Total number of registered Malaysian zone C and C2 fishing vessels in each landing sites from three states

State	Landing Sites	Number of fishing vessels by zone		Total
		Zone C	Zone C2	
Kelantan	Geting	33	10	299
	Tok Bali	7	249	
Terengganu	Besut	41	10	97
	Pulau Kambing/ Chendering	24	22	
Pahang	Kuantan	158	47	344
	Rompin	92	47	

Source: Fisheries Data Collection, Kelantan State, Terengganu State, and Pahang State 2015

The actual total number of questionnaire from survey in Thailand is 409 of which 101 was from Songkhla, 16 from Narathiwat, and 292 from Pattani. This covers only 42.25% of the total number of fishing vessels registered from the Thai fishing vessels statistic. For Malaysia, the actual total number of questionnaire from survey is 459 fishing vessels, which operating in C and C2 zones as follows 135 from Kelantan, 69 from Terengganu, and 255 from Pahang. These numbers only account for 62.03% of the total number of fishing vessels registered under the national database.

Table 3: Classification of fishing zone in Malaysia

Zones	Area	Classification
A	From shore up to 5 nm	Reserved solely for small-scale fishermen using traditional fishing gear and owner-operated vessels.
B	5-12 nm	Reserved for owner-operated commercial fishing vessels of less than 40 GT using trawl nets and purse seine nets. There is no restriction for zone B operators to operate in C Zone and C2 Zones as well as B Zone.
C	12-30 nm	Commercial fishing vessels of more than 40 GRT using trawl nets and purse seine nets are allowed to operate. C Zone operators are allowed to operate in C Zone & C2Zone, but not otherwise. Example, C2 vessels can only operate in C2 Zone (not allowed entering C Zone and B Zone).

<i>Zones</i>	<i>Area</i>	<i>Classification</i>
C2	30-EEZ limit or 200 nm	Beyond 30 nm where deep sea fishing vessels of 70 GRT and above are allowed to operate.

V) PROCESS OF DATA ANALYSIS

The process of data analysis is separated to two levels; first level and second level of data analysis.

First level of data analysis

First level of data analysis is general analysis into percentages and comparison between countries. The topic is as follows: vessel information, fishing operation and fish landing information, vessel monitoring system information, and total catch information.

Second level of data analysis

Second level of data analysis is an advance analysis into the assumed illegal fishing vessels from questionnaire which consider the following:

1. Port of survey
2. Number of vessels at specific port
3. Specification of vessels (color of super structure, name and ID number, port register, type of fishing gear)
4. Previous name and nationality of flag
5. Area of fishing/ landing
6. Number of crew and nationality
 - Number of crew for purse seiner is not more than 20 persons. If number of crew is in between 30 to 40 persons, then it is assumed as illegal fishing
 - Number of crew for trawler is not more than 10 persons. If number exceeds 10, it is assumed as illegal fishing
7. Nationality of captain
8. Number of working days/month at sea
 - Working day at sea cannot exceed 3 days. If more than 3 days, the survey assumes the act as illegal fishing
 - Comparison between working day at sea and fuel consumption. If fuel consumption higher than normal working day at sea, it assumes that the act is illegal fishing
9. Fuel consumption
10. Source of provision (location)
11. Source of ice supply (location)

Table 4: Fuel consumption rate (1 gal = 3.78 liter, 1 hp = 0.746 kw)

Generator Size (kW)	1/4 Load (gal/hr)	1/2 Load (gal/hr)	3/4 Load (gal/hr)	Full Load (gal/hr)
20	0.6	0.9	1.3	1.6
30	1.3	1.8	2.4	2.9
40	1.6	2.3	3.2	4
60	1.8	2.9	3.8	4.8
75	2.4	3.4	4.6	6.1
100	2.6	4.1	5.8	7.4
125	3.1	5	7.1	9.1
135	3.3	5.4	7.6	9.8
150	3.6	5.9	8.4	10.9
175	4.1	6.8	9.7	12.7
200	4.7	7.7	11	14.4
230	5.3	8.8	12.5	16.6
250	5.7	9.5	13.6	18
300	6.8	11.3	16.1	21.5
350	7.9	13.1	18.7	25.1
400	8.9	14.9	21.3	28.6
500	11	18.5	26.4	35.7
600	13.2	22	31.5	42.8
750	16.3	27.4	39.3	53.4
1000	21.6	36.4	52.1	71.1

Source: www.dieselserviceandsupply.com/Diesel_Fuel_Consumption.aspx

Moreover, the photo of fishing vessels is very important in assuming illegal fishing by consideration as follow;

1. Temporary name of fishing vessels



2. Mixing of Thai name and Malaysian number



3. Mixing system of marker



4. Fishing vessels name and boat structure contrary

The fishing vessels construction of Thailand and Malaysia differs on the style of each country. The assumption on illegal fishing vessels in second level of data analysis can consider from identification of fishing vessels character as *table 5*

Table 5: Identification of fishing vessels character between Thailand and Malaysia

<i>Thai fishing vessels</i>	<i>Malaysian fishing vessels</i>
1. Vessels name is “Thai language” with license number	1. Vessels name is code of state and number in English letter
2. Symbol at forward hull (both side) is ∩	2. Color of superstructure according to state
3. Port register name at stern “English language”	3. Fishing zone is marked at superstructure <ul style="list-style-type: none"> • Code of Zones must be painted on both sides of super structure in white with a black background • Size of the code of zone to be painted is according to the vessels size
4. Color of superstructure is not compulsory	
5. Fishing Zone is not compulsory (no marking)	
6. Hull shape is Thai style	

Table 6: Code of permanent letters and color of superstructure for fishing vessels in each state in Malaysia

<i>State</i>	<i>Permanent Letter</i>	<i>Color of superstructure</i>
Pahang	PAF	Light Yellow
Terengganu	TRF	Light Green
Kelantan	KNF	Bright Red
Perlis	PSF	Dark Blue
Kedah	KHF	Dark Red
Pulau Pinang	PPF	Light Blue
Perak	PKF	Dark Yellow

<i>State</i>	<i>Permanent Letter</i>	<i>Color of superstructure</i>
Selangor	SLF	Orange
Negeri Sembilan	NSF	Dark Green
Melaka	MKF	Purple
Johor	JHF	Blue
Labuan	LNF	Red

5. Fishing gear feature on board.

The fishing gear feature and operation equipment on board of Thailand and Malaysia is different depending on each country. The assumption of illegal fishing vessels in second level analysis can consider from fishing gear feature on board.

Thailand

Malaysia

Trawler



Purse Seiner



RESULTS OF THE SURVEY

FIRST LEVEL OF DATA ANALYSIS

Vessels information

The baseline survey by questionnaire found that most of fishing vessels in Thailand is purse seiner, while that in Malaysia is trawler. There are 51.84% and 71.77% respectively. About 96.09% of Thai fishing vessels were registered in Thailand, while 3.91% did not reply in the questionnaire. With reference to Malaysia, 100% of its fishing vessels registered in their country.

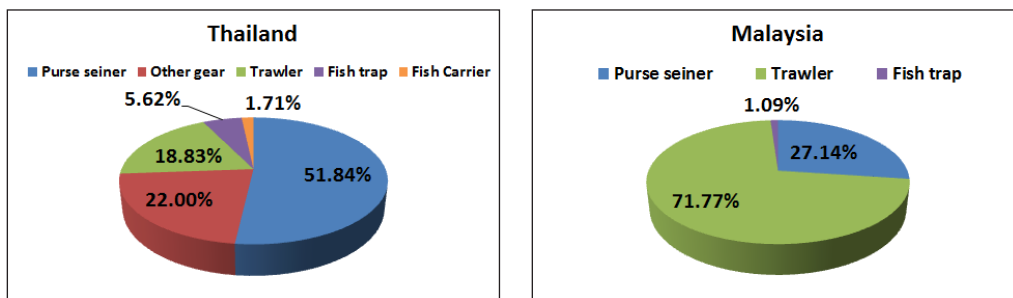


Figure 1: Percentage of Fishing Vessels

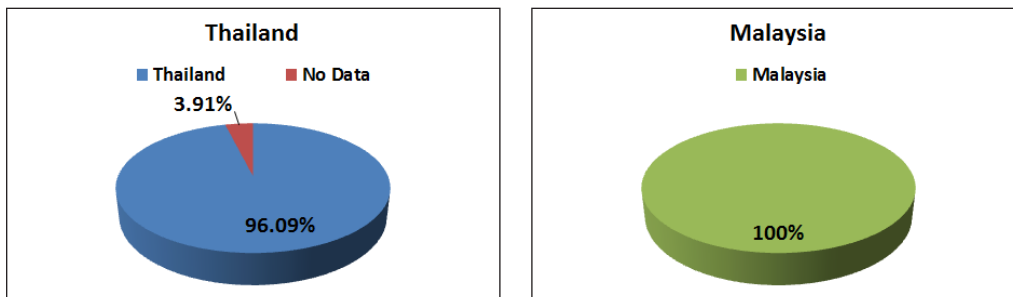


Figure 2: Percentage of Fishing Vessels Registered

The length of fishing vessels in both countries is categorized into four ranges: less than 12 meters, 12 to 17.99 meters, 18 to 23.99 meters, and 24 meters and over. The most frequent recorded length in both countries are 18 to 23.99 meters, with statistics showing 72.79% in Thailand and 79.06% in Malaysia. The engine size is categorized into four ranges: less than 100 Hp, 100 to 219 Hp, 220 to 499 Hp, and 500 Hp and over. The most frequent engine size of both countries is 220 to 499 Hp. The results found 69.44% in Thailand and 85.12% in Malaysia.

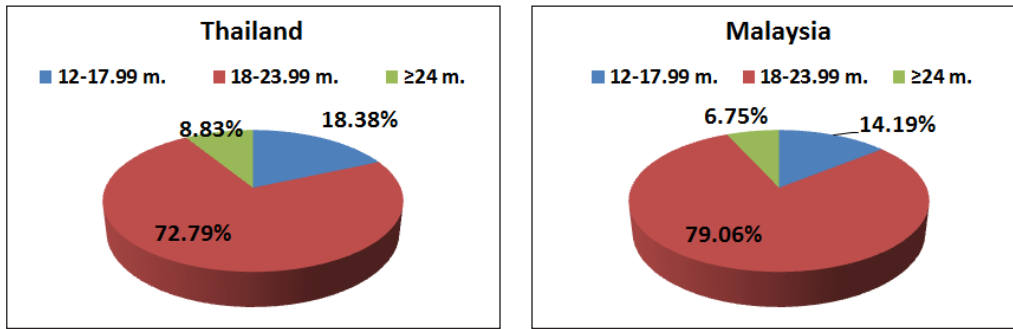


Figure 3: Percentage of Length of Fishing Vessels

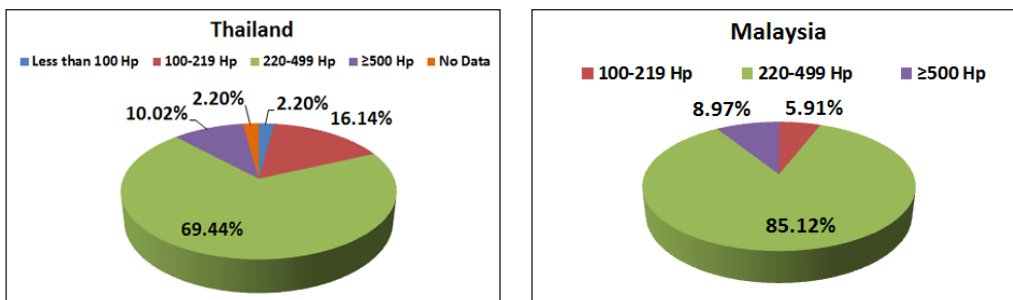


Figure 4: Percentage of Engine Size

Fishing operation and fish landing information

The most of common fishing vessels in Thailand (98%) and Malaysia (96%) operate in their waters. However, some of the Thai fishing vessels operate in Malaysia, Thailand and Malaysia, and others area. About 1% of Malaysian fishing vessels operates in others area and about 3% did not reply to the questionnaire. In Thailand, most of fishing vessels has a Thai flag (96.33%) and about 3.67% did not reply in the questionnaire. This contrasts the statistics of Malaysia, which showed that all of Malaysian fishing vessels has a Malaysian flag.

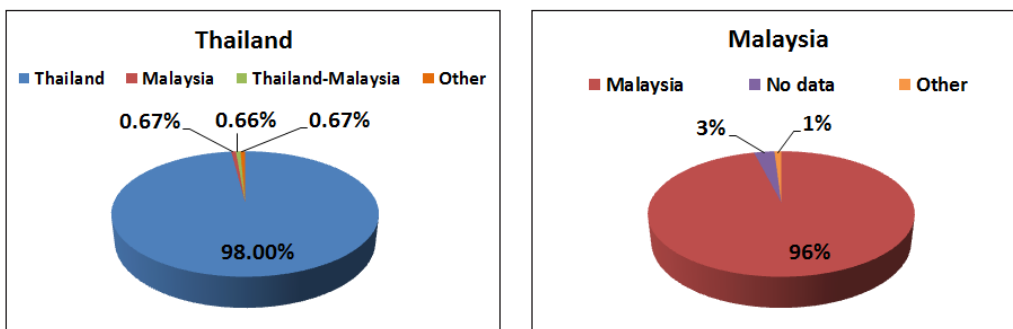


Figure 5: Percentage of Fishing Ground Area

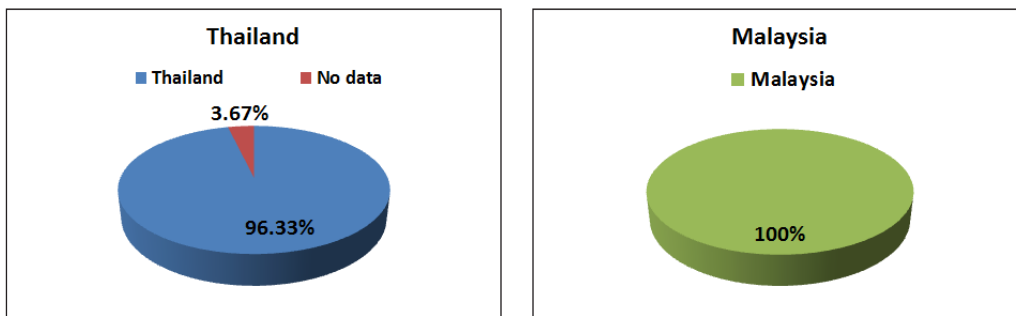


Figure 6: Percentage of Vessel Flag

In regards to the nationality of the captain/ master fisherman in Thailand, most of them are Thai, while the nationalities of crew members are Cambodian, Burmese, Thai, and Lao. In Malaysia, the majority of the the captain/ master fisherman are Malaysian, while the nationalities of crews are Thai, Malaysian, Vietnamese, Cambodian, Lao, and Burmese.

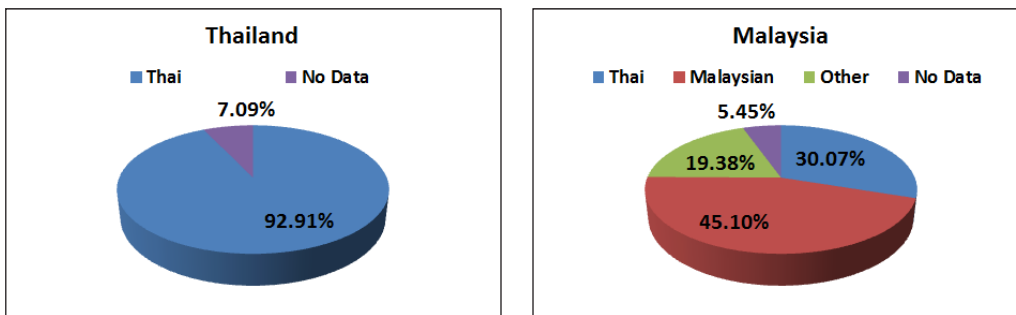


Figure 7: Percentage of Nationality of Captain

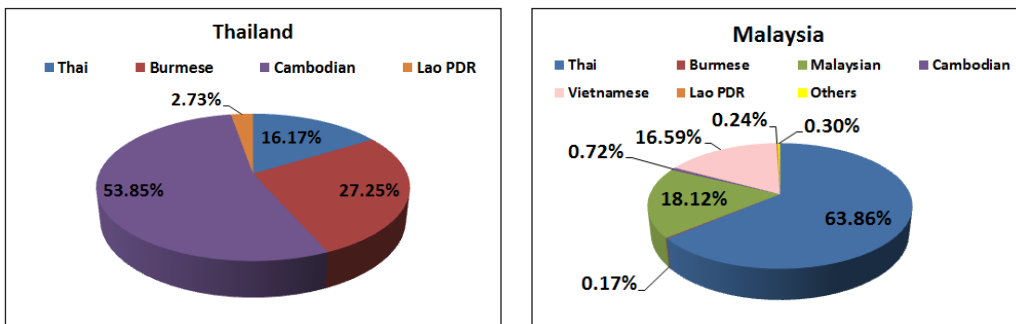


Figure 8: Percentage of Nationality of Crews

For fish landing port, most of Thai fishing vessels are landing in Thai fishing ports (98%) and all of the Malaysian fishing vessels are landing in Malaysia fishing port. Both countries bought supply as fuel, ice, provision, vessels maintenance, and fishing equipment from their country.



Figure 9: Percentage of Fishing Landing Port

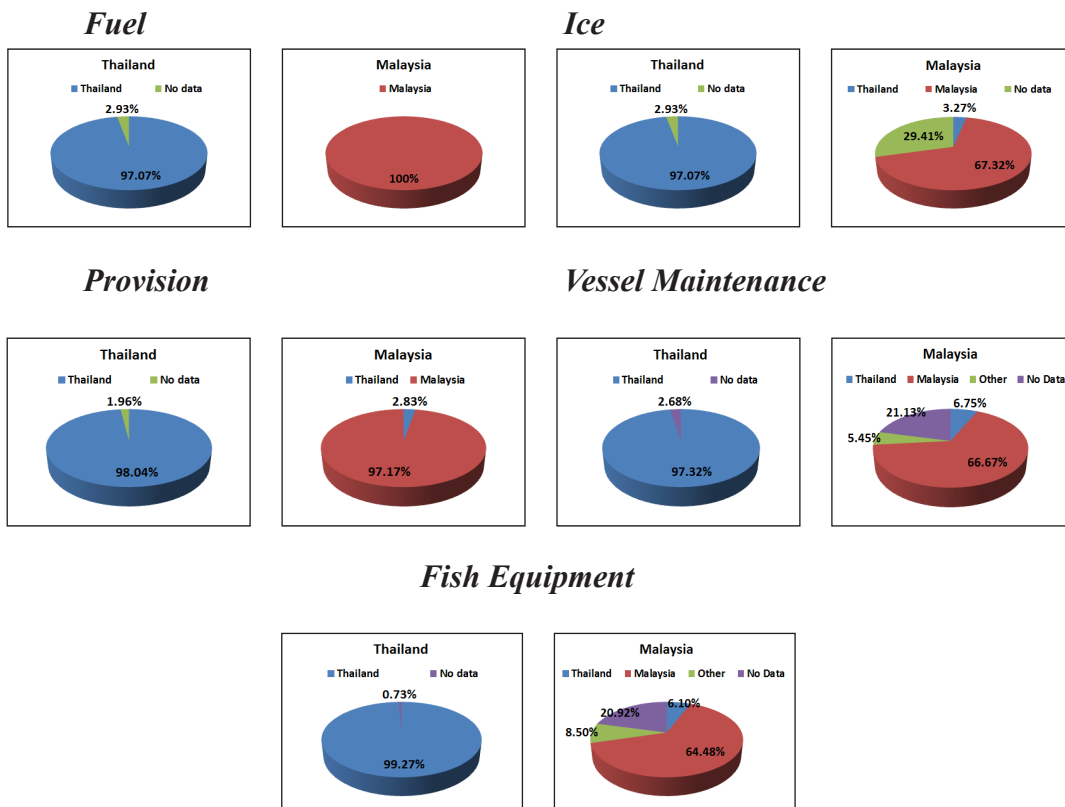


Figure 10: Percentage of Supply

Vessel Monitoring System (VMS) information

In Thailand, 16.63% of fishing vessels installed the Vessel Monitoring System (VMS), 75.55% did not install the VMS and 7.82% did not reply the questionnaire. In Malaysia, the VMS was installed by 36.17%, and not installed by 63.83% which is from the Zone C fishing vessel. Only Zone C2 fishing vessels in Malaysia were compulsory to install with VMS.

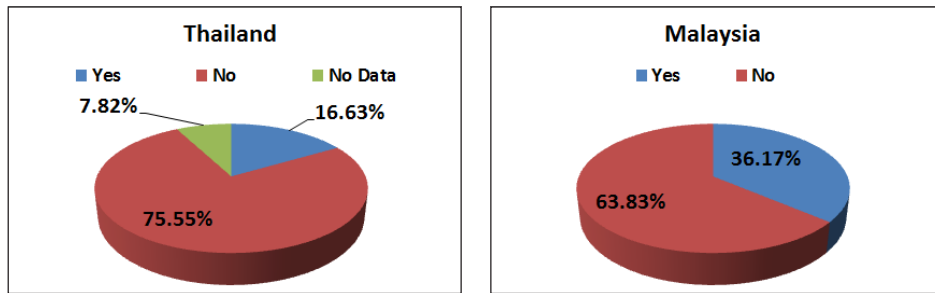


Figure 11: Percentage of Vessel Monitoring System (VMS)

Total catch information

The highest total catch in Thailand is purse seine, trawler and fish trap, which are 72.78%, 12.46%, and 4.14% respectively. While Malaysia are trawler, following by purse seine and fish trap at 54.30%, 45.37%, and 0.13% respectively.

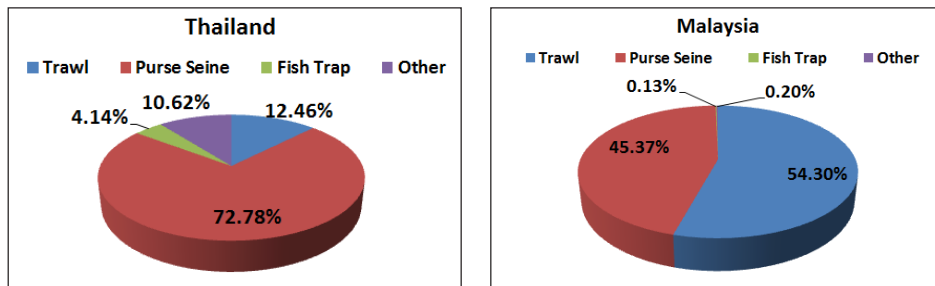


Figure 12: Percentage of Total Catch by Type of Fishing Gear

SECOND LEVEL OF DATA ANALYSIS

The second level of data analysis consists of information from questionnaire survey and photos of fishing vessels in both countries taken from 868 samples. The results found that about 12.4% can be assumed as illegal fishing vessels¹.

Assumption of illegal fishing vessels by type of fishing gear

The assumption of illegal fishing vessels by type of fishing gear: most of them are purse seine (62.27%), cast net (20.75%) and carried (7.55%).

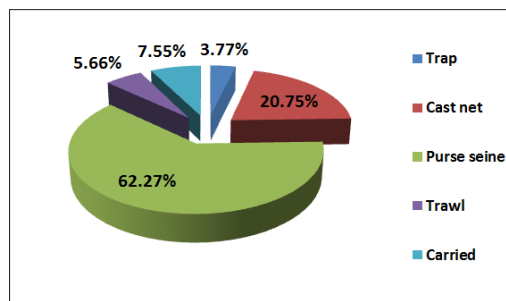


Figure 13: Percentage of Total Catch by Type of Fishing Gear

¹ The results of assumption of illegal fishing vessels from baseline survey which consider from survey in Malaysia will instead by the word of "IUU fishing vessels"

Assumption of illegal fishing vessels by length

The assumption of illegal fishing vessels by length in meters are categorized by four ranges: less than 12 meters, 12 to 17.99 meters, 18 to 23.99 meters, 24 meters and over. The result found that 71.70% of illegal fishing vessels fall into the category of 18 to 23.99 meters in length. The average length is 16.3 meters and medium is 18 meters.

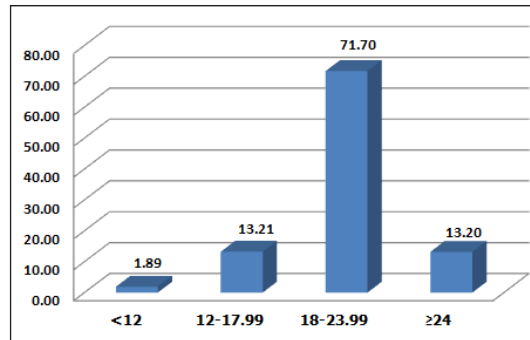


Figure 14: Percentage of illegal fishing vessels by length (meter)

Assumption of illegal fishing vessels by Gross Ton (GT)

The assumption of illegal fishing vessels by GT found that the majority (90.57%) of are 30 GT and over.

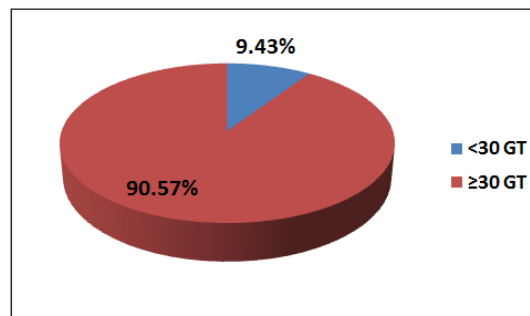


Figure 15: Percentage of illegal fishing vessels by Gross Ton (GT)

The baseline survey on fishing efforts and landing in the Southwestern Gulf of Thailand by questionnaire was conducted from March to September 2015. Simultaneously, Thailand implemented Port in-Port out Control (PIPO)² as a measure to combat the IUU fishing vessels. The fishing vessels which not registration cannot go to the sea for fishing operation.

² Port in-Port Out Control (PIPO) is a measure to combat the IUU fishing vessels which full implement in July 2015 in Thailand. Regard to this system, the fishing vessels weight 30 gross tonnage and over have to report before 12 hours when they entry and depart to the fishing port with the required documents such as Fishing License, Boat registration, Log book, ID of Master fisherman, etc. The fishing vessels which not registration cannot go to the sea for fishing operation

CONCLUSION AND RECOMMENDATION

The baseline survey found that most of fishing vessels in Thailand is purse seiner (51.84%), while Malaysia is trawler (71.77%). 96.09% of Thai fishing vessels registered in Thailand, while 3.91% did not reply in the questionnaire. Contrastingly, all Malaysian fishing vessels registered in their country. Most of length of fishing vessels in both countries is 18 to 23.99 meters, while engine size is 220 to 499 Hp. Most of fishing vessels in Thailand (98%) and Malaysia (96%) operate in their own waters. In regards to nationality of captain/master fisherman in Thailand, most are Thai while the nationalities of crews are Cambodian, Burmese, Thai, and Lao. In Malaysia, nationality of captain/master fisherman, most of them are Malaysian while the nationality of crews is Thai, Malaysian, Vietnamese, Cambodian, Lao, and Burmese. For fish landing, most of Thai fishing vessels are landing in Thai fishing port (98%) and all of Malaysian fishing vessels are landing in Malaysia fishing port. Supplies, such as ice, fuel, provision, vessels maintenance, and fishing equipment, were bought from their country. The Vessel Monitoring System (VMS) was successfully installed to 16.63% of Thai and 36.17% of Malaysian fishing vessels. The highest total catch in Thailand are purse seine (72.78%), trawler (12.46%) and fish trap (4.14%), while in Malaysia are trawler (54.30%), purse seine (45.37%), and fish trap (0.13%).

Assumption of IUU fishing vessels from baseline survey is 12.41%. Most of illegal fishing vessels are purse seine. Most of illegal fishing vessels length is 18-23.99 meters, average at 16.3 meters and weighing 30 GT and over. However, in the same period of baseline survey, Thailand implemented Port in- Port Out Control (PIPO) system to combat the IUU fishing vessels. Regard to this system, the fishing vessels weight 30 GT and over have to implement this system. According to this system, the fishing vessels less than 30 GT should be watchdog because it is easy to entry to illegal fishing operation.

The main reasons why fishing vessels enter other countries (country A entry into country B) depend on

- *Nationality of master and crews*: during the closing season of fishing or not fishing operation season, there is a high possibility that the master fisherman and crews will go back to their home country by fishing vessels.
- *Facilities (dockyard, provision)*: good and comfortable facilities, such as dockyard, provision, are influence to fishing vessel entry use those facilities.
- *Location and distance between countries to landing in fishing port*: near proximity of fishing ports influences the total saving cost of fuel and reduces the amount of time in between sailing and landing fish.
- *Fish price*: good price is influence to sell their fish product.

Recommendations and suggestions to improve the planning, development, and management of fishing effort, and monitoring of landing in Malaysia and Thailand Sub-region are given as follow:

1. Establish a Memorandum of Understanding (MoU) between Malaysia and

Thailand through landing information dissemination that covers the area of Songkhla Province, Pattani Province, Narathiwat Province in Thailand and Kelantan, Terengganu and Pahang in Malaysia;

2. Identify and appoint a National Coordinator, who will oversee the exchange of landing information;
3. Promote the improvement of fishing effort management in close cooperation between local authorities nearby boundary;
4. Encourage and emphasize the need for vessels marking inspection, in accordance with national regulation;
5. Consider and develop tools for fishing vessels less than 24 meters in length to reduce illegal fishing activities;
6. Encourage the usage of information from VMS for validation of fishing ground;
7. Expand research: baseline survey activity should not only be considered for commercial fishing vessels, but also for small-scale fishing vessels. The results of baseline survey will be used as information for planning and development of activities to improve management of fishing effort and monitoring landing in Sub-region.

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GLOSSARY

Cast net	Big cast net, which in the past has been used for Indo-Pacific mackerel, became popular in the 1970s for squid-fishing used by boats with luring lights. An improvement was made by adding a purse line to the bottom edge of the net. This type of cast net (stick-held cast net) is one of the most widely used gears in Thailand.
Fish Carrier Vessels / Carrier Ship	A fishing vessels that processes and transports the catch (fish or other marine products, for example, shrimp or squid) to the port. The fish and other marine products are caught by catching vessels, which remain onboard the carrier ship route to the fishing grounds. This piggyback arrangement cuts down on the time needed to move the fleet to the fishing grounds and to deliver the catching vessels to distant areas. In the fishing grounds, the carrier ship launches the catching vessels, which are equipped for independent fishing. It directs the operations of the vessels and provides fish-finding services. If fishing is scarce, the carrier ship can lift the fishing vessels onboard in a relatively short period of time and move to other grounds.
Gill net	The size of the vessels varies from open boats up to large specialized drifters, operating on the high sea. Gill nets can be operated from boats and canoes on inland waters and inshore, decked small vessels in coastal waters and medium sized vessels fishing offshore. In coastal waters it is very common that gillnetting is used as a second fishing method carried out by trawlers or beam trawlers, according to fishing season and targeted species.
Longliner	Hand operated longlining can be carried out with boats and vessels of all size. Number of hooks and lines handled depends on the size of the vessel, the degree of mechanisation and the size of the crew. Almost all vessels can function as a longliner to some degree; however, there are large longliners built with the purpose of engaging in single species fisheries, such as those for tuna.

Port in-Port out system

Port in-Port Out Control Center (PIPO) was introduced on May 6, 2015, with the aim of measuring and combatting the IUU fishing vessels. The center is set up at the Coastal Fisheries Radio Station. It was fully implemented in July 2015. There are 28 centers in the 22 seaside province of Thailand. The fishing vessels weight 30 gross tonnage and over have to report before 12 hours when they entry and depart to the fishing port with the required documents such as Fishing License, Boat registration, Log book, ID of Master fisherman, etc. Port in-Port Out System is cooperated between the Department of Fisheries, Marine Department, Marine Police, Nave, Department of Labour Protection and Welfare, etc.

Purse seiner

Purse seiner

These vessels comprise of a large group, appearing in all sizes ranging from small boat to open ocean going vessels. Purse seiners are the most important and most effective vessels that can be used to catch aggregated species near the surface. The vessels surround the shoal with a deep curtain of netting while the bottom of the net is pursed (closed) underneath the shoal by hauling a wire, which runs from the vessels through rings on the bottom of the net and back to the vessels. Searching for shoals, and assessing the size and direction of movement of it are the most important part of the fishing operation. To assist in fish detection, sometimes crows nests are arranged on masts and on large vessels observation towers and helicopter landing decks are provided.

Purse seine with Fish Aggregating Devices (FADs)

Thai fishermen prepare the anchored FAD using materials, such as bamboo poles, wire and coconut leaves, which are then fastened together into a concrete block. The purse seine operation by surrounding FAD (coconut leaf shelter).

Surrounding Nets

Surrounding nets have been used by Thai fishermen in coastal water for a long time. Initially, they were small-scale gears used for catching planktonic shrimp, anchovies and other species found in shallow waters near the coast. Small cotton net was operated by fishermen with or without rowing boats. Later, two wooden poles for closing the bottom part of the net were added to the gear. This type of purse seine could be operated in either day or nighttime, to catch Indo-Pacific mackerel and mixed fish schools composed mainly of herrings, croakers, Indo-Pacific mackerel, thread-fin and sting ray.

Trawl

Trawler

Trawlers range in size from open boats, undecked, powered by outboard engines up to large freezer trawlers and factory trawlers which can fish in the extreme distant waters. Trawling is the most important and one of the most efficient fishing methods in the world. Today, commercial trawling is carried out in very shallow waters of 2000m in depth. These deep water vessels are provided with engines of sufficient power to tow the gear at the appropriate trawling speed.

Otter trawler

Otter trawlers tow one or several parallel trawls that are kept horizontally open with the aid of otter boards. Such trawls can be towed on the bottom and in mid-water. The vessels might be of any size from sail-driven canoes to large supertrawlers. The biggest trawlers are included in this vessels class. Generally, otter trawlers are equipped with two stern galleys with towing blocks through which the towing warps are running. Otter trawlers have normally two towing warps that are regulated from two winches. Medium sized and large trawlers are often fitted with a stern ramp on which the trawl is hauled onto the deck. Modern trawlers might be equipped with three towing warps and three winches, towing two parallel trawls (twin trawling). Otter trawlers also include outrigger trawlers towing one or two trawls from outriggers on both sides. Trawls towed from each outrigger are spread horizontally with two otter boards on each side.

Pair trawler

A pair trawler is one of two vessels towing one single trawl. The two vessels open the trawl horizontally by keeping a distance when towing. Otter boards are not used. Pair trawlers can operate mid-water and bottom trawls. They handle only one warp each and therefore only one winch is required. Most pair trawlers are, however, equipped with two winches as some use two warps when mid-water pair trawls and some are using two winches to split long towing warps between two drums. Specialized pair trawlers are not equipped with galleys as they tow the single warp from the stern (Asian and Spanish pair trawlers), often from a fixed towing point (hook).

Trap

Fish trap or Trap setters

These vessels are used for setting pots or traps for catching fish, lobsters, crabs, crayfish and other similar species. Trap setters range from open boats operating inshore up to larger decked vessels of 20 to 50m, operating to the edge of a continental shelf.

Squid trap

Squid traps are operated in association with squid eggs, which are used for attraction. The frame is constructed of bamboo. Now the frame is covered with net and it is constructed to catch fish.

ANNEX

Questionnaire on baseline survey on fishing effort and landing in the Southwestern Gulf of Thailand

Name of Port interview.....Province/State.....

Date.....Time.....Respondent.....

Interview by.....from (agency).....

Remark: 1) Please take a photo of vessel that you interview

Part I: Vessel Information

1. Vessel name (if any).....

2. Vessel registration number.....

3. Vessel owner name.....

4. Specification symbol of vessel

Color of vessel.....

Color of wheel house.....

Other Specification symbol.....

5. Type of vessel

Fishing vessel (method/ gear)

Trawler Purse seiner Fish trap other.....

Fish Carrier vessel

6. Port of registry Thailand Malaysia other.....

7. Size of vessel

Gross tonnage (GT/ GRT)..... Breadth(B).....meters

Length (L).....meters Depth (D)meters

8. Engine power.....Hp /Brand of engine.....

9. VMS system in the vessel have no have

10. Fishing area Thailand (location.....)

Malaysia (location.....)

other (location.....)

11. Nationality of vessel (flag) Thailand Malaysia other.....

12. History of vessel (if any)

- Previous name/ registration number.....
- Previous flag Thailand Malaysia other.....

13. Nationality of captain/master Thailand Malaysia other.....

14. Number of crew (total).....persons

- Nationality of crew

Thai.....persons	Myanmar.....persons
Malaysian.....persons	Cambodian.....persons
Vietnamese.....persons	Lao PDR.....persons
Other...../.....persons	

Part II: Fishing Operation and Fish Landing Information

15. Fishing Operation

- Number of trip per month.....trips
- Number of days per trip.....days
- Number of fishing operation per day.....times
- Actual number of fishing day per trip.....days

16. Major target species

Total amount of catch per trip.....kg.

- Name of fish..... amount of catch per trip.....kg.
- Name of fish..... amount of catch per trip.....kg.
- Name of fish..... amount of catch per trip.....kg.
- Name of fish..... amount of catch per trip.....kg.
- Other amount of catch per trip.....kg.
- Trash fish..... amount of catch per trip.....kg.

17. Landing Port

- Name of port.....Country Thailand Malaysia other.....
- Name of port.....Country Thailand Malaysia other.....
- Name of port.....Country Thailand Malaysia other.....

18. Supply

- Fuel: amount.....liters per trip / Source (location.....)
 Thailand Malaysia other.....
- Ice: amount.....kg. per trip /Source (location.....)
 Thailand Malaysia other.....
- Provision/ Source (location.....)
 Thailand Malaysia other.....
- Vessel maintenance / Source (location.....)
 Thailand Malaysia other.....
- Fishing equipments / Source (location.....)
 Thailand Malaysia other.....



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