Method of data collection in the Andaman Sea

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ABSTRACT

The data collection of marine fisheries in Thailand has conducted by two responsible units , namely Fishery Statistics Analysis and Research Group and Marine Fisheries Division.

The purse seine is the main fishing gear for pelagic species, especially neritic tuna in the Andaman Sea. The previous sampling data were collection data from port sampling in catch and size by Research group and logbook in catch (voluntary basic) from Fishery Division.

In 2016 the sampling method reforms such as sampling frequency increased from 1-2 to 4-6 times per boat per trip, target species, etc. Other information will be collected and complied from Vessel Monitoring System (VMS), logbook, record fish unload and Port in-Port out data. All information will be gathering together, then will be analyzed the result for calculation the Maximum Sustainable Yield in 2017.

INTRODUCTION

At present, marine fisheries are important sector for Thailand both socially and economically aspects. However, unless addressed urgently the challenges in marine fisheries management are still existed. These could be a serious impact for marine fisheries management in the future. There are many effects from malfunction of fisheries management e.g. severe degradation of fisheries resources through over capacity, illegal, unreported and unregulated fishing (IUU) and etc. In order to solve these problems the Marine Fisheries Management Plan (FMP) 2015-2019 has implemented since 2015. One of method that has outlined to manage the challenges facing in Thailand is data collection of marine fisheries. These data collection method has objective to monitor status of fisheries resources by using the analyzed data to solve current issues.

The Kingdom of Thailand locates in Southeast Asia region which bordered in west and northwest by Myanmar, in East and northeast by Lao, the southeast by Cambodia, in south Malaysia. Thailand was surrounded by two seas. East coast is by the Gulf of Thailand and Southwest is by the Andaman sea. The Andaman sea has coast line 894 km^2 consist of 6 provinces; Ranong, Phang-nga, Phuket, Krabi, Trang and Satun provinces (figure1). Andaman sea area is an important fishing ground both in commercial and small-scale including landing site for foreign fishing vessels. In 2013, along the Andaman sea has fishing vessel around 1,924 vessels. Commercial vessel was 40.80% of all which 26% was purse seiner and 15% was trawler. The fishing ground of commercial fisheries was along the coast of Andaman Sea. Ten landing sites located from Ranong to Satun provinces. Purse seine fisheries are operated throughout the year, January to April and November to December are the peak fishing season. Species composition mostly comprised of pelagic fish i.e. Indo-Pacific mackerel, Indian mackerel, Scads, neritic tuna, sardines, and etc. The assigned tasks for Andaman Sea Fisheries Research and Development Center (AFRDEC) are data collecting and data analysis in different types of fisheries. AFDEC has been

monitored fisheries activities through the database collection by sampling program, processing and analysis of fishing data in order to sustainable of fisheries resource management in the Andaman Sea.

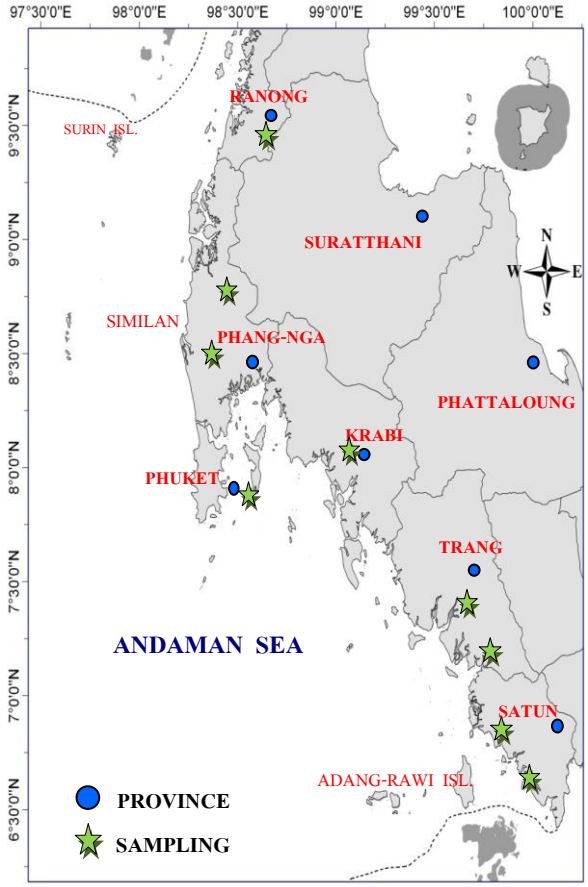

Figure 1 sampling site along the Andaman Sea coast of Thailand

1. Data Collection in Thailand

DOF Thailand, has two unit for responsible in this mission i.e. 1) Fishery Statistics Analysis 2) Research Group and Marine Fisheries Division. However, both of those units do have the different methodology in collecting data as follow;

1. Fishery Statistics Analysis and Research Group is the unit to implement and analysis data of Thailand's fisheries in overview. The Provincial Fisheries Office in 76 provinces will be collecting data every month and send all data back to Fishery Statistics Analysis and Research Group to analyze later. The data collections include marine fisheries, inland water fisheries, type of fishing gear, amount and value of target species, commercial fisheries, small-scale fisheries, processing industries, marine and inland culture.

The Provincial Fisheries officer will be interview fishing master or owner of fishing vessel about catch and sale composition. Sometimes, they have asked for sell slips also. In addition, the office has registered fishing vessels. These data would be sent to Fishery Statistics Analysis and Research Group every year. After that will be analyzed and published data (Figure 2) and website.

Figure 2 Publications from Fishery Statistics Analysis and Research Group, DOF

2. Marine Fisheries Research and Development Division (MFRD) which has 5 research centers and 2 stations operated under responsible. All of these have responsibility in collecting data, doing research and fisheries resources assessment in Thai waters. The collection method is sampling program by type of fishing gear. For local purse seine, AFRDEC has been collected data 2-3 days monthly in each each fishing port. There are 2 steps in field trip data collection.

First is interview: Mostly fisheries officer has interviewed fishing master about fishing effort is total catch, day per trip, number of haul, fishing ground, depth, species composition, fish price, and problems in fishing. Sometime ask size of fishing gear, size of vessel or some techniques for fishing.

Second is sampling: the sampling size were not less than 30 kg/vessel, to identify species and measure total length fish size by punching paper in centimeter and also measure weight in gram (Figure 3). Marine Fisheries Division was assigned to collect data of local purse seine for measure total length fish size (except Neritic tuna and Torpedo scad) measure fork length. Have fish target 16 species are Indian mackerel (*Rastrelliger kanagurta*), Short mackerel (*Rastrelliger brachysoma*), Japanese scad (*Decapterus maruadsi*), Shortfin scad (*Decapterus macrosoma*), Bigeye scad (*Selar crumenophthalmus*), Oxeye scad (*Selar boops*), Yellowtail scad (*Atule mate*), Yellowstripe scad (*Selaroides leptolepis*), Torpedo scad (*Megalaspis cordyla*), Goldstripe sardinella (*Sardinella gibbosa*), Kawakawa (*Euthynnus affinis*), Bullet tuna (*Auxis rochei*), Frigate tuna (*Auxis thazard*), Longtail tuna (*Thunnus tonggol*), Indo-Pacific king mackerel (*Scomberomorus guttatus*) and Narrow-barred Spanish mackerel (*Scomberomorus commersoni*).

Every month, data analysis has to be reported for fishing effort, percentage of species composition and length of fish. Mostly of purse seine has fishing ground in the Andaman Sea coast. MFRD will use this database to monitor and analyze the status of marine resources for sustainable management in long term.

Figure 3 Fish landing and sampling at landing place
a. Purse seine vessel b. Landing place c. The official collected data

2. The improved activities related to the Data Collection

2.1 Since 2015, Thailand has improved the data collection of marine fisheries by set up the Port in and Port out scheme.

- Check the number of fishing boat

The official checkup the number of vessels follow the license. That is important data for management.

- "Port in – Port out" (PIPO)

PIPO scheme has established since 1st May 2015, all fishing vessels over 30 gross ton. This system record information of each vessel including the types of equipment, types of caught fish, name of vessel, vessel registration, vessel license, fishery permit, and crew-members. Vessels are required to report these selected information to officer within 24 hours before going in and out from the port. However, every day has Port in-port out team check all document at the port.

- **Logbook** ; the fishing record information for catch composition and fishing ground daily.

- **Marine catch Purchasing Document (MCPD)**; Boat owners will sell marine catch to middlemen who sell the fish to processing plants. The processing plant has

been reported and submits catch certificate of Thailand, namely Simplified Catch Certificate of Thailand from DOF.

- Record fish unloaded; The DOF official record sale composition at the landing place. The official will random fishing vessels about 10%-20% of the total number of unloaded. This data will be cross checked with the data from logbook. The risk will be control this data don't exit over 10 % of logbook data.

Figure 4 Officer recording fish unload

- Vessel Monitoring System (VMS); The fishing vessel tracking systems would be used to control and monitor The fishing vessel bigger than 30 gross ton. The satellite (GPS) and a network of mobile phones (Global Service Mobile: GSM) are working together to determine coordinates fishing vessel (Vessel Positioning System: VPS). Not only the realtime system can be monitored by online application but can trace back navigation data of fishing vessel to analysis behavior of fishing vessel.

In order to force the fishermen to install only the fishing vessel with the size of 30 tons have to fast-up. The data of the ship will be sent to the Operations Center to monitor and predict the situation of the fishing Department of Fisheries Automatically. This easy to use these data can be recalled and print as a report. The officer will monitor the fishing vessel by authorize person using username and password (Figure 5). This data is confidential by the Official Information Act B.E. 1997. VMS system have established the warning system, if fishing vessel operated in the protected areas. In addition, fishermen can press the emergency buttons on the boat for calling assistance to the center of the action and the owner of the ship to contact the relevant authorities to assist in a timely manner the one action center VMS can send data in the form of SMS (short message service) to inform the news or the alarm to all the ships in the system.

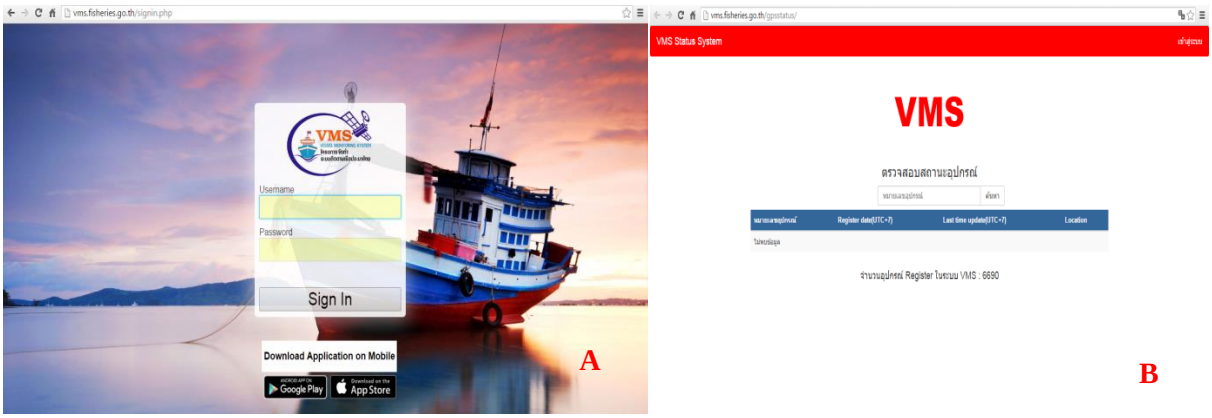

Figure 5 VMS system A. Login B. Status
from: http://vms.fisheries.go.th/

2.2 Marine Fisheries Management Plan of Thailand

For the past 30 years ago, fisheries resources and the marine environment have been seriously degraded through overfishing brought by a lack of control of fishing capacity in terms of increasing number of fishing vessels and in adopting new technologies, which were not commensurate with the natural productivity of the resources. These challenges provided fertile ground for the proliferation of illegal, unreported and unregulated (IUU) fishing within Thai fisheries waters.

Thailand is now committed major reforms based on a limited entry regime. These reforms are enabled through a new Royal Ordinance for Fisheries B.E. 2558 (2015). This Marine Fisheries Management Plan (FMP) of Thailand has outlined the actions and measures needed to achieve sustainable fisheries in the future and to control the fishing capacity to a level commensurate with the maximum sustainable yield (MSY) of the resources. The FMP was applies to all marine capture fisheries both artisanal and commercial vessels in Thai waters as well as marine capture fisheries conducted by Thai vessels in the exclusive economic zone (EEZ) of other States and the high seas. In Thai waters the fishing areas are those in the east (Gulf of Thailand) and those to the west (Andaman Sea).

In order to implement the FMP, it needs to improve data collection for assessment with the maximum sustainable yield (MSY). Therefore, Marine Fisheries Division has improved the method of data collection for commercial and small-scale gears. For purse seine gear the method would be collected monthly from January to December 2016 by multi-state sampling. Around 50 specimen/fishing gear/fishing ground/month will be sampling to identify species and measure total length fish size (except longtail tuna measure fork length) by punching paper in centimeter and also measure weight in gram. Catch data, price by size in each species will be record in baht/kilogram. Fishing effort and fishing ground will be collect by interviewing fishers. Have 6 the target species are Indian mackerel (*Rastrelliger kanagurta*), Short mackerel (*Rastrelliger brachysoma*), Goldstripe sardinella (*Sardinella gibbosa*), Narrow-barred Spanish mackerel (*Scomberomorus commersoni*), Kawakawa (*Euthynnus affinis*) and Longtail tuna (*Thunnus tonggol).*

Then, the new schemes of data collection from various sources, such as port sampling, logbook, unloaded catch and VMS will be complied together. Then, theses data set will be used to analyzed the maximum Sustainable Yield in 2017.

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