Understanding the role of Malaysian Fisheries Management in the fisheries data collection.

Sallehudin, J[1]., Samsudin, B[1]., Effarina, M.F[1]. and Nor_Azlin, M.[2]

Capture Fisheries Division,
FRI Kampong Acheh,
Department of Fisheries
32000 Sitiawan Perak.
Malaysia

[1]Capture Fisheries Division FRI Kg Acheh 3200, Sitiawan perak,
[2]Management and Licensing Division, Department of Fisheries, PUTRAJAYA

Abstract

The Department of Fisheries Malaysia is responsible for the collection of national fisheries statistics. For the purpose of collection of landing statistics, the Department of Fisheries divides the coastal belts into fisheries districts. Total catch and effort data collected from various landing sites are recorded in the computer system at the State Office and these data are then send to the main database server in Fisheries Headquarters. For conservation of the national marine resources increases and for better quality data, Department of Fisheries Malaysia has started to implement vessel logbook programs and these programs were initiated for the pelagic longline fisheries. In line with the improvement on data collection, Department of Fisheries Malaysia has successfully implemented a Vessel Monitoring System (VMS) for all high seas fishing vessels and Automatic Identification System (AIS) for the coastal fishing vessels. To further improve quality of tuna catch data, Department of Fisheries plans to install CCTV on the tuna vessels to monitored fishing activities at sea and also help to prevent illegal transshipments, discards, and potential overfishing. The main output is the Annual fisheries Statistical bulletin and it is can be utilized to determine the status and trend of the fisheries. Furthermore, the information will be used to formulate policies and planning strategies for the development of the country's fisheries industry.

Keywords: Data collection, Logbook, VMS, AIS, Annual Fisheries Statistic

1.0 Introduction

In geographical terms, Malaysian fisheries is divided into three; Peninsular Malaysia, Sabah and Sarawak. Peninsular Malaysia consists of two major fishing areas; the Strait of Malacca as part of Indian Ocean off the west coast of Peninsular and South China Sea in eastern coast, which together with Sarawak and Sabah. While Sabah fisheries include Sulu and Celebes Sea in the east coast Sabah. (Figure 1)

Figure 1: Malaysian fishing areas including the Straits of Malacca

1.1 Fisheries Sector Overview

The fisheries sector is an important sub-sector in Malaysia and plays a significant role in the national economy. Apart from contributing to the national Gross Domestic Product (GDP), it is also a source of employment, foreign exchange and a source of protein supply for the rural population in the country. Fish constitutes 60-70% of the national animal protein intake, with per caput consumption of 47.8 kg per year. The rate of demand for fish as the main source of protein is expected to increase from the current annual consumption of 630 000 tonne to over 1 579 800 tonne by 2010 (using an estimated population of 26 330 000 with a per caput consumption of 60 kg/year). In 1997, the fisheries sector contributed 1.57% to GDP, and it provides employment for more than 79 000 fishermen and 20 000 fish farmers. Basically, the fisheries sector has three main subsectors, namely marine capture fisheries, aquaculture, and inland fisheries.

Total estimate catch of marine fish from Malaysian waters in 2016 were 1.57 million mt, a slide increased 6% compared to 1.48 million in 2015. The total landing in 2016 were attributed to the catch from 56,111 registered vessels with trawlers, purse seines, drift nets contributed large percentage of the catches. In 2016, marine fish production from the west coast of Peninsular Malaysia (Malacca Straits) contribute 813,758 mt (51.8%) out of the total catch. The remaining catches were from the South China Sea and Sulu Celebes Seas, east coast of Sabah. Coastal fisheries produced 76% (1,195,359 mt) and the rest from offshore fisheries.

It is generally well accepted that the coastal fishery resources have been fully exploited. There is possibly some extent of overfishing. Over the years the Department of Fisheries (DOF) has tried various measures in an attempt to reduce the coastal fishing effort.

2.0 Data Collection System.

2.1 Fisheries Statistics Data

The DOFM is responsible for the collection of national fisheries statistics. Administratively, the DOFM has set up offices at district and state levels in the country. District offices are responsible for collecting data of marine capture fisheries, aquaculture and inland capture fisheries. Each district office reports to the state office who then compile and submit to the headquarters where the data are processed and published in the Annual Fisheries Statistics (Volume 1) and uploaded in the DOFM website (www.dof.gov.my). These statistical data can be utilized to determine the status and trend of the fisheries. Furthermore, the information will be used to formulate policies and planning strategies for the development of the country's fisheries industry.

2.2 Landing sites

For the purpose of collection of landing statistics, the Department of Fisheries divides the coastal belts into fisheries districts (Figure 2). There are 41 fisheries districts on the West Coast of Peninsular Malaysia, 18 on the East Coast, 15 in Sarawak and 12 in Sabah, giving a total of 68 fisheries districts. Landings data are gathered from all these districts,

but the details are left out in the compilation of the Annual Fisheries Statistic published annually by the Department of Fisheries Within each fisheries district there can be several landing sites, so there are hundreds of landing sites throughout the country. Information on the quantity of fish landed at each of these landing sites is not available.

Total catch and effort data collected from various landing sites are recorded in the computer system at the State Office and these data are then send to the main database server in Fisheries Headquarters in Putrajaya. Recently the system has been upgraded where the data are keyed in from the district office computer system with direct network to the database server in the State office via a Wide-Area network. Data from the state database are then forwarded to the main server in Putrajaya also through the leased line. DoF Headquaters in Putrajaya uses a RISK UNIX based machine with Oracle data Base management System. Data processing is basically done using fixed application program to convert the data to structure report. The final product is the Annual Fisheries Statistical Bulletin. (Figure 3)

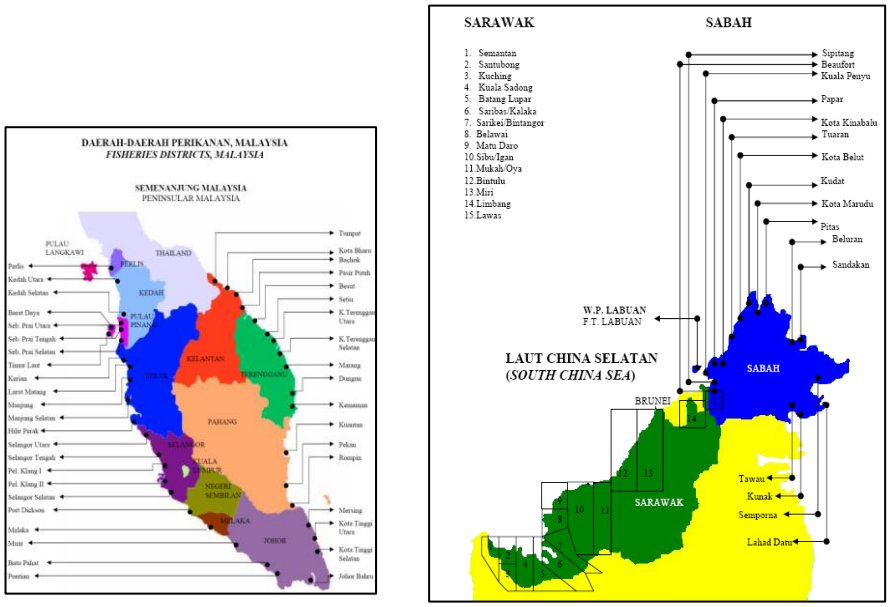


Figure 2 . Fisheries administrative district in Malaysia

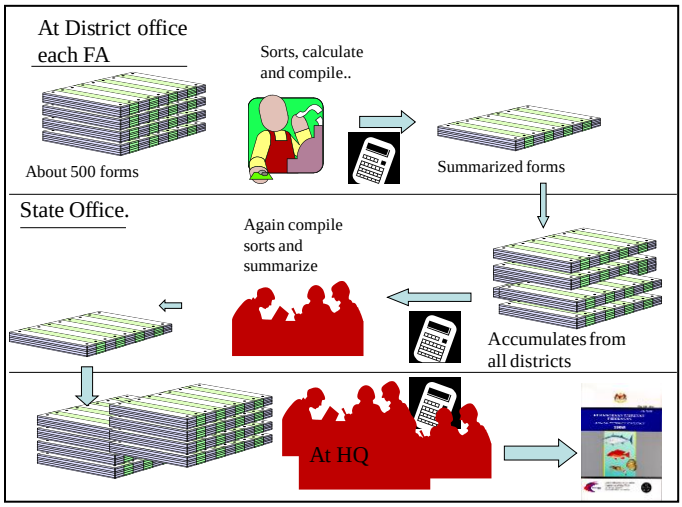


Figure 3: Schematic illustration of processing fisheries data from district level to publish in Annual Fisheries Statistical book.

2.3 Design data collection and flow information

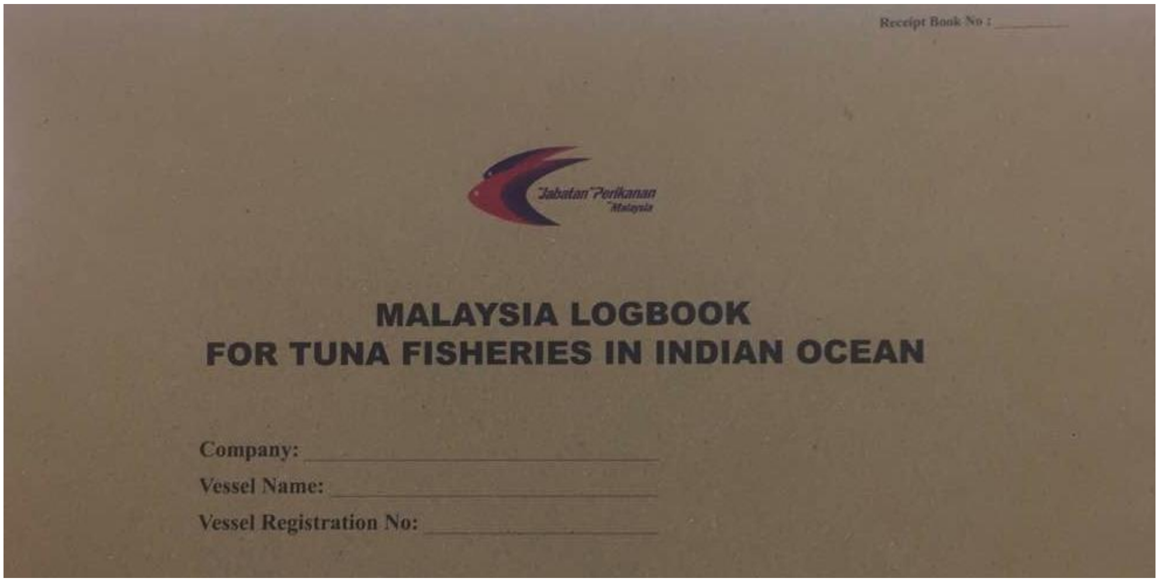
Each state in Malaysia was divided into fisheries administrative districts. Each fisheries administrative district was assigned at least one Fisheries Officer or Fisheries Assistant as a full time enumerator collecting mainly catch and effort data. Effort data collection was helped by licensing Fisheries Assistance who kept a

'Punch Card' System'. Where Licensing Fisheries Assistance records all licensing transaction such as issuance of new license for vessels, cancellation, renewal, change owner, state, gear-type etc. Frame surveys were conducted every two years for every state and this is fine tuned every month to include illegal fishing activities and exclude inactive vessels or fishing vessel that do not go out fishing for the month. The total number of vessel operating, information on active licensing and operating illegal vessel were than gathered. These figures will be the multiplying factors to estimate the total landings in the end.

2.4 Logbook Programs

As the need for conservation of the national marine resources increases, the need for more and better quality data on how these resources are utilized also increases. One of the most useful types of data is catch per unit effort. To meet these needs, Department of Fisheries Malaysia has started in September 2017 to implemented vessel logbook programs and these programs were initiated for the pelagic longline fisheries (Figure 4). Fishermen are required to report the numbers of each species caught, the numbers of animals retained or discarded alive or discarded dead (longline gear is non-selective and unwanted or prohibited species such as, billfishes, sea turtles, etc., must be returned to the water), the location of the set, the types and size of gear, and the duration of the set. Because some of the needed catch/effort information for pelagic longline fisheries remains the same for the entire trip (i.e., it would be redundant to report it for every set), a supplemental form is used to report this type of data. Information on the port of departure and return, unloading dealer and location, number of sets, number of crew, date of departure and landing are reported on the Trip Summary form. In addition, information on costs associated with the trip can be reported on this form. Information on the quantity caught for each species, the area of catch, the type and quantity of gear, the date of departure and return, the dealer and location (county and state where the trip is unloaded), the duration of the trip (time away from dock), an estimate of the fishing time, and the number of crew are included on this form.

Catch Report Form



MALAYSIA

Flag: MALAYSIA	Gross Tonnage□□位:	Gear Configuration: Long Liner
Name of Vessel船名:	Hold Capacity□□容□:	Setline Length(m):
Registration No. 登□□□:	Vessel Length (m):	Branchline Length(m):
International Call Sign: IMO No:	Name of Captain船□名:	Floatline Length(m):
IOTC No:	Number of Crew船□人□:	Length between branches(m):
Vessel's Owner船□:	Report Date:	Type of bait :
Address地址:	Report By:	No of Hooks:
		Day in fishing area:

Departure

Mth	Day	Year	Port 出港港口	

Arrival

Mth	Day	Year	Port 出港港口	

FISHING OPERATION

Day	Date		Position		Sea Water Temp	No of Hooks	Southern Bluefin Tuna (SBF)		Yellowfin Tuna (YFT)		Bigeye Tuna (BET)		Albacore (ALB)		Skipjack Tuna (SKJ)		Swordfish (SWO)		Striped Marlin (MLS)		Blue Marlin (BUM)		Black Marlin (BLM)		Indo-Pacific Sailfish (SFA)		Shortbill spearfish (SSP)		Other Bony Fish (MZZ)		Total	
	日期		□□度		水□				串仔		大目		□串				□旗		旗□						旗□		其他				□□	
	mth	day	Lat N/S	Long E/W	C	No.	No.	Kg.	No.	Kg	No.	Kg	No.	Kg	No.	Kg	No.	Kg	No.	Kg	No.	Kg	No.	Kg	No.	Kg	No.	Kg	No.	Kg.	No.	Kg
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Day	Date		Position		Blue Shark (BSH)		Mako Shark (MAK)		Tiger Shark (TIG)		Crocodile Shark (PSK)		Great White Shark (WSH)		Porbeagle Sharks (POR)		Hammerhead Sharks (SPN)		Silky Sharks (FAL)		Thresher Sharks (THR)		Oceanic Whitetip Sharks (OCS)		Other Sharks (SKH)		Seabirds		Marine Mammals (MAM)		Marine turtle (TTX)	
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	mth	day	Lat N/S	Long E/W	R	D	R	D	R	D	R	D	R	D	R	D	R	D	R	D	R	D	R	D	R	D	R	D	R	D	R	D
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SIZE FREQUENCY

No. of Fish	Southern Bluefin Tuna (SBF)		Yellowfin Tuna (YFT)		Bigeye Tuna (BET)		Albacore (ALB)		Skipjack Tuna (SKJ)		Swordfish (SWO)		Striped Marlin (MLS)		Blue Marlin (BUM)		Black Marlin (BLM)		Indo-Pacific Sailfish (SFA)		Shortbill spearfish (SSP)		Blue Shark (BSH)		Mako Shark (MAK)		Tiger Shark (TIG)		Crocodile Shark (PSK)		Great White Shark (WSH)		Porbeagle Sharks (POR)		Hammerhead Sharks (SPN)		Silky Sharks (FAL)		Thresher Sharks (THR)		Oceanic Whitetip Sharks (OCS)	
	Weight (gram)	*Fork Length* (cm)	Weight (gram)	*Fork Length* (cm)	Weight (gram)	*Fork Length* (cm)	Weight (gram)	*Fork Length* (cm)	Weight (gram)	*Fork Length* (cm)	Weight (gram)	*Fork Length* (cm)	Weight (gram)	*Fork Length* (cm)	Weight (gram)	*Fork Length* (cm)	Weight (gram)	*Fork Length* (cm)	Weight (gram)	*Fork Length* (cm)	Weight (gram)	*Fork Length* (cm)	Weight (gram)	*Fork Length* (cm)	Weight (gram)	*Fork Length* (cm)	Weight (gram)	*Fork Length* (cm)	Weight (gram)	*Fork Length* (cm)	Weight (gram)	*Fork Length* (cm)	Weight (gram)	*Fork Length* (cm)	Weight (gram)	*Fork Length* (cm)	Weight (gram)	*Fork Length* (cm)	Weight (gram)	*Fork Length* (cm)	Weight (gram)	*Fork Length* (cm)
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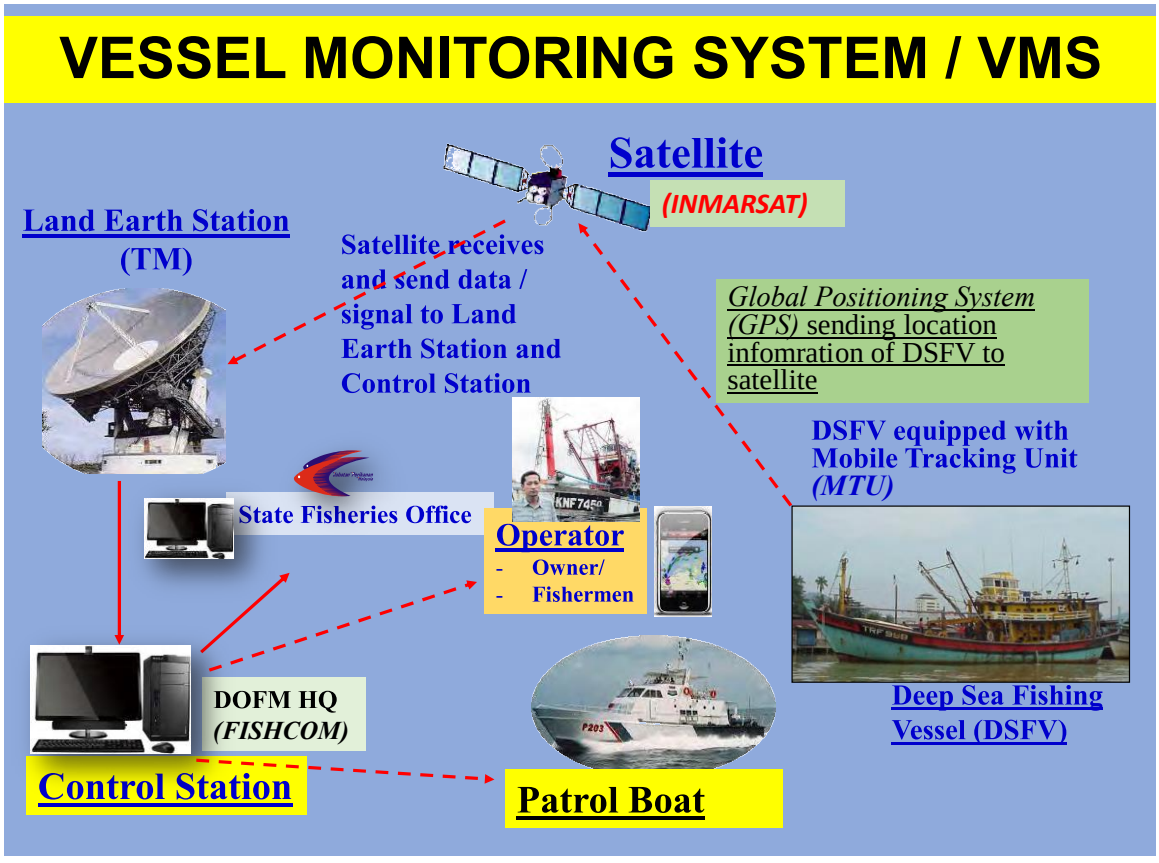
Figure 4, Malaysian logbook for tuna fisheries in Indian Ocean

2.5 Vessel Monitoring System (including date commenced and status of implementation)

Department of Fisheries Malaysia has successfully implemented a Vessel Monitoring System (VMS) for all highseas fishing vessels. It is based on Inmarsat, utilizing Inmarsat C, Mini C and D+/B equipments. For tuna longline vessels operating beyond Malaysian EEZ, they use Argos system for their VMS. It enables us to track a vessel‟s compliance with the geographical limits contained in their license and to check position data contained in their catch and effort/transshipment reports. The installation of Mobile Transceiver Units (MTU) is mandatory under vessel licensing regulation. Failure to do so, will cause the license of the vessel to be revoked or suspended as provided under the Fisheries Act 1985. To date, all Malaysian longline have the devices installed



To improved the MCS or Monitoring, Control and Surveillance, Malaysia Government by Department of Fisheries has agreed to install the Automatic Identification System

(AIS) for fishing vessels operating in Zone B who those operating five nautical miles or more from the coast.

The system will provide basic tracking, location, speed and border crossing capabilities developed by the Malaysian Fisheries Department.

The AIS can also be used as a supporting document to prove that the vessel had not crossed international borders. It is also equipped with a distress button or to alert authorities during accidents at sea.

2.6 Additional data

For the research purposes, Fisheries Research Institute (FRI) also engage in catch and effort and biological data collection activities in selected areas. These activities are carried out as part of the research projects. The activities mostly depending on the specific funding with limited time and it difficult to sustain long term monitoring of for example the state of resources.

Under the 11th Malaysia Plan (2016-2020), the Department of Fisheries has provided an allocation for conducting and improving data collection on tuna landing (neritic and oceanic tuna) from selected fishing ports. One of the study site is Kuala Perlis which is one of the important fishing port for large purse seines operating the major fishing areas in the northwest of Peninsular Malaysia. Two enumerators were stationed at the Kuala Perlis fishing port to record daily catch effort data including size data of neritic tuna species such as kawakawa, longtail and frigate tuna. Another two enumerators will be engage with the same tasks and stationed in Perak.

To further improve quality of tuna catch data, Department of Fisheries plans to implement observer onboard (OBB) for purse seine vessels fishing in the domestic waters. Due to the lacking of financial resources (insufficient fund), the lacking of man power (staff) or human capacity and communication problem within captain and crew, the observer onboard program planning still under consideration. To be improving quality of tuna catch data with other alternative were been suggested. Department was

propose to install CCTV on the tuna vessels to monitored fishing activities at sea and also help to prevent illegal transshipments, discards and potential overfishing.

2.7 Recreational Fisheries Data

Apart from marine capture fisheries data, Malaysian Fisheries Department is also planning to collect catch data from marine recreational fisheries activities. The catches from marine recreational fisheries contributed over a thousands metric tons annually but until now no proper recording is in place. From 2018, the recreational fishing activities need to get official permit from the DoF. They are required to record their catch and effort using logbook. Confirmation of the catch data will be verify by fisheries officers to ensure the validity of the data. In future, the recreational data will be used also as a source of catch data.

3.0 Reporting

The main output is the Annual fisheries Statistical bulletin for public use and as a important source of information in implementing fisheries management. Currently, this annual report is produced in digital format and department homepage display the summarize of fisheries statistic.

4.0 Conclusions

There is some improvement on understanding the importance of quality fisheries data collection system toward efficient management of marine fisheries. Some efforts have be in place to tackle the problem of less reliable data recording by the current system. Technical awareness input from ongoing capacity building programs conducted by various regional fisheries bodies including IOTC will expedite improvement of future data collection program.

5.0 References

Anon. 2010. Annual Fisheries Statistic, Department of Fisheries, Malaysia

Nor Aisyah A.B 2010. NATIONAL INITIATIVES CONCERNING TUNA INFORMATION COLLECTION / REPORTING. Department of Fisheries Malaysia. Unpublished.

Nor Aisyah.A.B. 2009. LESSON LEARNED IN IMPLEMENTING FISHING LOGBOOK AND/OR OBSERVER PROGRAM. Department of Fisheries Malaysia. Unpublished

Teo S.W. 2000. Malaysia Fisheries Statistic. Department of Fisheries Malaysia. Malaysian Technical Cooperation Program. Unpublished.