



REPORT

**THE 3RD CORE EXPERT MEETING ON “COMPARATIVE STUDIES FOR
MANAGEMENT OF PURSE SEINE FISHERIES IN THE SOUTHEAST ASIAN
REGION”**

**Kuala Lumpur, Malaysia
12-14 September 2017**



Prepared by:
**Noorul Azliana Jāmaludin,
Mohammad Faisal Md Saleh,
Raja Bidin Raja Hassan,
Nurul Nadwa Abdul Fatah**

**SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER
MARINE FISHERY RESOURCES DEVELOPMENT AND MANAGEMENT
DEPARTMENT**

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**SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER
MARINE FISHERY RESOURCES DEVELOPMENT AND MANAGEMENT
DEPARTMENT**

Core Expert Meeting on Comparative Studies For Management Of Purse Seine Fisheries In The Southeast Asian Region (3rd : 2017 Kuala Lumpur)

REPORT: THE 3rd REGIONAL CORE EXPERT MEETING ON “COMPARATIVE STUDIES FOR THE MANAGEMENT OF PURSE SEINE FISHERIES IN THE SOUTHEAST ASIAN REGION”, Kuala Lumpur, Malaysia, 12-14 September 2017 /

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**3rd Core Expert Meeting on Comparative Studies for
Management of Purse Seine Fisheries in the Southeast Asian
Region**



12-14 September 2017, Kuala Lumpur, Malaysia

Adopted report

I. INTRODUCTION

1. The Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region was organized by SEAFDEC/MFRDMD at Furama Hotel, Kuala Lumpur, Malaysia from 12 to 14 September 2017. The meeting was attended by the representatives from Cambodia, Indonesia, Malaysia, Myanmar, The Philippines, Thailand and Viet Nam; as well as resource persons from Japan and Malaysia, the representatives from SEAFDEC/TD, the Chief, Deputy Chief and Officials from SEAFDEC/MFRDMD. The List of Participants appeared in Annex 1.
2. The objectives of the meeting were: to share the latest information about landings and CPUEs of purse seine fisheries in the region, to compile the current management measures for purse seine fisheries in the region, to share experience on data processing for management of purse seine fisheries and to understand the population structure for *Amblygaster sirm*.

II. OPENING OF THE MEETING

3. In his welcome message, the Deputy Chief of SEAFDEC/MFRDMD, Dr. Kenji Taki expressed his gratitude to all participants from the SEAFDEC participating member countries for their efforts to attend this meeting and expected to deepen his knowledge on Purse Seine management that he thinks is more applicable in the ASEAN region. His welcome remarks appeared in Annex 2.
4. The meeting was officially opened by the Chief of SEAFDEC/MFRDMD, Mr. Raja Bidin Raja Hassan. He hoped participating Member Countries could share on the latest information about pelagic fisheries and management of purse seine fishery. He emphasized the important to examine the fishing capacity for Purse Seine and some management measures to address the common issues faced in this region and hoped delegates could tap valuable information from invited resource person from Japan appeared in Annex 3.

III. ADOPTION OF AGENDA AND OVERVIEW OF THE PROGRAM ACTIVITY

5. This session was chaired by Chief of SEAFDEC/MFRDMD and the meeting agenda was presented by Dr. Kenji Taki, Deputy Chief of SEAFDEC/MFRDMD. The agenda was adopted with a little amendment as in Annex 4.
6. Project Coordinator, Mr. Mohamad Faisal Md. Saleh, presented Overview of Project as appeared in Annex 5. Besides reporting the background of the project, he also reviewed the availability of statistics data of landing data, fishing effort and catch per unit effort (CPUE) in the region that will be the focus of this project. The presentation also viewed the case study in Malaysia for landing trend and CPUE standardization. Species composition in the region was also presented and current statistics data that had been collected and compiled by MFRDMD were also showed. Based from the issues and challenges raised up, all the Member Countries were aware of very importance of the reliable data statistics to come out with good management on Purse Seine fisheries. One report on “2nd Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region 2016” was published in 2017 and had been disseminated to all SEAFDEC member countries.

IV. COUNTRY PRESENTATIONS

7. Dr. Chea Tharith, from Cambodia presented Purse Seine Fishery in Cambodia. The presentation was appeared in Annex 6. In his presentation, purse seine fishery in Cambodia was highlighted. With three purse seine boats operated in two provinces with 2-5 days per trip and 9 to 10 trips per month, catch trends from long-tailed boat (Gill net) was presented. The species that mainly had been caught by purse seine boat in Cambodia were scads, sardines, *Rastrelliger* spp. and anchovies; and biological information such as spawning season and length at first maturity of *Rastrelliger brachysoma* in 2004 and trend of CPUE was also highlighted in his presentation. It was also informed in this presentation that fishery resources in Cambodia were declining while number of small-scale boat was increasing and motorized. Capacity building in Cambodia on determining TAC for Purse Seine was also still lacking.
8. The first part of country report from Indonesia was presented by Mr. Imron Rosyidi as in Annex 7. His presentation mainly focuses on overview of Purse Seine fisheries management in Indonesia. For the second part of the country report from Indonesia presented by Mr. Suwarso was highlighted on the purse seine fishery management in Natuna Sea and adjacent waters. The meeting was also informed that currently, there are three kinds of Purse Seine; small, medium and large to catch the pelagic species in Indonesia. The catch trend in Pemangkat as an example was viewed besides biological information such as species composition together with management measures implemented in the country from the study conducted in 2014 through national project and from 2003 to 2005 through SEAFDEC project was also presented. A biological

sampling was done from 2014-2016 on reproduction aspects (length of maturity) of *Decapterus russelli*, *R. kanagurta* and *Selar crumenophthalmus*. A CPUE trend on the species was also conducted in 2013. Moreover, the meeting was informed that the implementation of Observer on board program conducted by Indonesia was concordant with requirement by other International Commissions such as the IOTC. Likewise, currently a special unit responsible in harmonizing the landing data collected and to manage 34 provinces in Indonesia, management measure such as vessel registrations is responsible by central government and registration book by province government. Regarding the design of fishing gears in their country, Mr. Suwarso stressed that the design emanated from the local fisherman with approval from the central government.

9. The Report for the East Coast of Peninsular Malaysia was presented by Mr. Sallehudin Jamon from Fisheries Research Institute (FRI) Kg. Aceh, Perak. He reported that catch trend of pelagic fish and anchovy in East Coast Peninsular Malaysia based from statistical data from Department of Fisheries, Malaysia. Other information such as CPUE and biological information was also presented. Currently, the status of pelagic fish in East Coast Peninsular Malaysia according to biomass was 405,332 MT and MSY was 202,466 MT. The meeting was informed that the study for the close season on pelagic species e.g. *R. kanagurta* is on-going that started from 2015 to 2020. The presentation appeared in [Annex 8](#).
10. The report for the Purse Seine Fishery of the West Coast of Peninsular Malaysia was presented by Mr. Abdul Wahab Abdullah from FRI Kg. Aceh, Perak. He started with information on type of purse seine vessels, zoning and fishing areas and partly on latest relevant rules and regulations. The meeting was informed that the West Coast zoning system has been revised in 2014, among others to create a conservation zone of 1 nm from the shoreline and to change the zoning boundaries. The trend of vessels, landings and also CPUE and catch composition for purse seine vessels were also highlighted. His presentation appeared in [Annex 9](#).
11. The country report on Purse Seine Fishery in Sarawak, Malaysia was presented by Mr. Jamil Musel from FRI Bintawa, Sarawak. He reported on overview of catch trend in Sarawak by purse seine. He also presented the result for CPUE of pelagic in Sarawak, Malaysia and status of pelagic fish stock in Malaysia based on the acoustic survey conducted in 2014 and published in 2015. Chief of MFRDMD suggested doing FISAT analysis and cover all categories because it was presumed that during data analysis did not cover certain range of size and this can give bias to the result generated by FISAT, therefore can have better result and thus can view the true scenarios of resource in Sarawak. His presentation appeared in [Annex 10](#).
12. Mr. Mohd Zamani Nayan from Department of Fisheries Sabah, Malaysia presented on the "Purse Seine Fisheries in Sabah". He briefly described fishing effort of PS from 2009 to mid of 2017. The status of pelagic stock in Sabah also was showed from the acoustic method. However, the data and biological information (e.g. length of first

maturity and spawning season) was currently unavailable. Information on management strategy such as control of licensing and enforcement and the closed season approach that still on planning was also reported. Chief of MFRDMD also informed that based from the acoustic survey conducted the status of pelagic fisheries in Sabah is still encouraging and the resource is still enough. In addition, final report of acoustic study from Peninsular Malaysia, Sabah and Sarawak are already completed and will be published soon. His presentation appeared in [Annex 11](#).

13. The country report from Myanmar was presented by Mr S. Julius Kyaw entitled Purse Seine Fishery in Myanmar. He elaborated that purse seine fishery management in Myanmar, landing trend, CPUE and biological information of pelagic species. The meeting was informed fishing area in Myanmar was divided into four regions with Rakhine was abundant for anchovy, Ayeyarwady for hilsa; and Taninthayi for sardinella and mackerel. The presentation was appeared as in [Annex 12](#).
14. Mr. Ronnie Romero presented Country report of the Philippines. Based on his presentation he provided an overview of the Philippines Capture Fisheries specifically on Purse Seine Fisheries. Fishing effort of purse seine, status of pelagic stock in Philippines and existing management strategies for purse seine were also highlighted in his presentation. He informed that starting 1998, Philippines had started the National Stock Assessment Program (NSAP) which provided significant data towards the establishment of a close season for roundscad in Palawan, Philippines in Sulu Sea. He also presented the CPUE trend of purse seine based from the National Stock Assessment Program (NSAP) of the Philippines from CY 1998 to CY 2016. Moreover, the dominant species caught during this period was presented. He further reported that there are two types of Purse Seine used in the Philippines, the Sardine/ Scad/ Mackerel Purse Seine and Tuna Purse Seine. Moreover, the Meeting was informed that aside from the Catcher Boats, Carrier, Lighboat and Sonar boats more than 3 GT are also required to apply for license from the BFAR. His presentation appears as [Annex 13](#).
15. Dr. Watcharapong Chumchuen from Thailand reported 35% from marine capture production of Thailand were managed by purse seine which can be divided into two types; Thai Purse Seine (Black Seine) with mesh size greater than or equal to 25 mm that mostly catch Indo-Pacific mackerel, Indian mackerel, sardines, scads, bonitos, black pomfret and ponyfish with three fishing techniques (free school, light luring and fish aggregating device operations) and Anchovy Purse Seine with mesh size greater than or equal to 6 mm specifically catch anchovies with two types of anchovy purse seiners. In the presentation he also informed that the fishery act in Thailand was revised in 2015. For purse seine, the regulations were enforced to control the fishing power (gear and effort) whereby boat owners must renew their fishing license every 2 years. The landing trend by purse seiner from 1993 to 2014 was also presented besides species composition, length at first maturity, fishing effort and status of pelagic fish in Thailand. Meeting was also informed that Thailand had practice in time-area closure as their fisheries management strategy. The presentation as appeared in [Annex 14](#).

16. Mr Pham Van Tuyen presented the country report from Viet Nam. In this report, an overview of marine fisheries particularly purse seine fisheries in four areas; Gulf of Tonkin, Central, Southeast and Southwest Viet Nam was presented. Meeting was informed that the marine product from the purse seine was about 20.6% total catch and the main species of the local and commercial types of surrounding net are small pelagic fish and include: sardines, mackerels, round scads, neritic tunas, anchovies etc. There are two types of purse seines; luring purse seine that target on anchovy (anchovy purse seine) and luring purse seine that catch for small pelagic fishes. Meanwhile, second type of purse seine (searching purse seine) also target small pelagic fishes besides tuna.

Biological information from the survey conducted such as information on spawning season, fishing effort and fishery management strategies was also presented. Viet Nam representative also highlighted the important of future works to raise continuously knowledge especially among local fisherman, strengthening capacity for various stakeholders and collaborative study for management to manage pelagic resources in a sustainable manner. His presentation appeared in Annex 15.

17. General discussion of pelagic fisheries based on country presentations:

- i) Stock Assessment

Resource Person, Prof Dr Takashi Matsuishi informed unreliable data on landing and fishing effort will give a big impact to the management interpretation. Therefore, a detail review should be implemented to avoid any mistakes. Due to poor data collection by some country, Dr Takashi Matsuishi suggested to divide into good data and unreliable data (bad poor) so that accurate analysis for management on Purse Seine fisheries can be analyzed and come out with better result. Furthermore, Deputy Chief of MFRDMD suggested environmental data such as water temperatures in the fishery grounds should also be considered because this might clarify the reason of yearly big gap of the landing.

Meanwhile, Chief of MFRDMD suggested adding information from the hydro-acoustic survey for better understands the status of pelagic resource in the region. He also strengthened that the requirement of capacity building for stock assessment of pelagic fish in the region and informed that SEAFDEC willing to help Member Countries to access pelagic stock assessment by other method. e.g. surplus model.

- ii) Biological aspects

Resource Person, Prof Dr Takashi Matsuishi recommended Member Countries to get updated report for length of maturity. Based from the Member Countries' presentation, there were some of the different in length at first maturity among countries, Chief of MFRDMD suggested to find out the factor such as geography factor that may possible to cause the fish to mature early.

iii) Management strategies and regulation

Member countries highlighted the issue on regulation of fishery management strategies such as number of person on board need to be decreased (currently about 20 to 30 persons per boat) and fishing technique that need to be managed carefully. Representatives from Malaysia and The Philippines also recommended to look up on the issue of transshipment. As in SEA scenarios that their catch based on multispecies, Resource Person suggested fishery managers in the region to regulate what is the depleted species so that the fishery management of multispecies in this region could be easily to manage.

V. REVIEW ON CURRENT PURSE SEINE MANAGEMENT SYSTEMS (THAILAND & THE PHILIPPINES)

18. Cdr. Pornchai Singhaboon from Thailand presented Experience and Lesson-Learned on TAC implementation. In the presentation, he shared on how TAC was applied in Thailand that involves three processes; 1. Determination of Maximum Sustainable Yield (MSY) for three groups of marine resource (pelagic group, benthic group and anchovy group), 2. TAC consideration from about 90% of MSY and 3. TAC submission to National Fishery Committee for approval. Based on four types of allocation to the fishers for all fishing activities, in Gulf of Thailand 230,803 (t) for pelagic and 172,607 (t) for anchovy whilst in Andaman Sea 110,184 (t) for pelagic and 29,650 (t) was approved for TAC. The meeting was informed that the MSY determination was calculated using monthly monitoring system data collection using surplus model. The resource utilization according to two management areas and right-allocation for anchovy purse seiners in Gulf of Thailand was also presented. The implementation of TAC was started since 2016 in Thailand that every two years is the time for fishers to renew their fishing license and the next the right-allocation will be reviewed in 2018. However, due to some limitations in TAC system, Total Allowable Effort (TAE) system was indirectly applied instead of TAC system in order to manage pelagic resource in Thailand. The meeting was informed that the TAE was easily to monitor and control using port in - port out (PIPO) system. At this time, the improvement of TAC is still in progress and soon TAC system will be fully established. As for suggestion, Chief of MFRDMD recommended to use electronic system for effective monitoring system in future. The presentation as in Annex 16.
19. Representative from The Philippines, Mr Ronnie Romero presented on Experience and Lesson-Learned based on Target Reference Points (TRP). He explained that Harvest Control Rules (HCR) could be implemented if this Limit Reference Point (LRP) is reaching its target as the most sustainable point. He reported that the Philippines is till on process of coming up with a Reference Point using exploitation values. Moreover, a legislation on the HCR, RPs an Management Practice is on its final revision.

He expressed that MSY is the most ideal RP but due to the absence of a reliable inventory of fishing boats and gears in the Philippines, MSY cannot yet be used as RP as there is a need to come up with a comprehensive estimation of the fisheries production in the country. He also informed the Meeting that data analysis is continuing and MSY calculation will be ready probably the year after Fishing Boat and Gear Inventory in 2018 is done.

In connection to the LRP using e values, the reference data was collected from the National Stock Assessment Program (NSAP) and was expected to be mainstreamed in the BFAR regional office who conducts their individual regional analysis. In his presentation, he highlighted the concept of HCR and its implementation besides the example for Reference Point (RP) using exploitation value in the Philippines. His presentation also show the proposed Limit Reference Point for Philippine small pelagic fishes, neritic and oceanic tuna by fishing ground based on Exploitation (E) values using length-frequency data in 2015. A few case studies were also presented according to close seasons implemented in selected areas. He also stressed that strengthened participation of stakeholders and players of the industry such the Local Government Units (LGU) played significant roles in mainstreaming EAFM, FMA and Establishment of RPs. Moreover, consistent support from Regional Field Offices for the establishment of comprehensive fisheries management systems was vital in the successful implementation of BFAR Management Activities. His presentation appeared in [Annex 17](#).

VI. REGIONAL DATA ANALYSIS

20. Resource person of this project, Prof Dr Takashi Matsuishi from Hokkaido University, Japan presented Examples of Pelagic Stock Management in Japan. As an example, he presented stock assessment of Sardine in Pacific Coast of Japan for year 2016 focus on estimation on catch at age (Age Length Key, ALK). Virtual Population Analysis (VPA), estimated biomass (B) and exploitation rate (E), stock recruitment relationship and population dynamic prediction for deciding allowable biological catch (ABC) which is the scientific recommendation for TAC. However, he highlighted that for the tropical species, the application of ALK could be difficult. The presentation as in [Annex 18](#).
21. Ms. Wahidah Mohd Arshaad from SEAFDEC/MFRDMD, presented “Genetic study of *Amblygaster sirm* inferred by mitochondria DNA Cytochrome *b* (cyt *b*) in South China Sea and Andaman Sea”. In this presentation, she highlighted there were separated management unit of *Amblygaster sirm* in Southeast Asia based on genetic result. A few recommendations had been suggested before this conclusion can be confirmed such as additional sampling locations especially in Andaman Sea. Additional recommendations to use other gene other than cyt *b* could be considered for confirmation. The meeting has been informed that the analysis from Indonesia will be done by Indonesia representative and will be ready for next year. Chief of MFRDMD had recommended to use other

study such as morphometric study to confirm the stock structure of the selected species in the region. Her presentation appeared in [Annex 19](#).

VII. RELATED TO MANAGEMENT STRATEGY OF PURSE SEINE FISHERY

22. Prof Dr Takashi Matsuishi presented TAC Management for Multi-species Fisheries. He highlighted the scenarios happened to purse seine fishery in Malaysia that catch several species at one haul and selected fishery management of Pacific Bluefin Tuna *Thunnus orientalis* on how its regulation in Japan as an example. In Japan, this species was catch by purse seine and set-net fishery and quota for this species for Hokkaido was 58 tonnes during July 2017 to June 2018. A few solutions have been taken to manage this species whereby the total catch has exceeded its quota in only 4 days. Therefore, based on the example given, he recommended a few points for Purse Seine management such as; (i) Understand of the multi-species situations, (ii) Flexibility in the implementation and (iii) Monitoring scheme. Member countries also shared some of their country's experience on the use of set-net in their country. His presentation appeared in [Annex 20](#).
23. Chief of MFRDMD, Mr Raja Bidin Raja Hassan presented Introduction to the Concept of Fisheries Management Plan (FMP). In his presentation, he highlighted the steps and process of FMP. The examples of FMP practices in Australia and USA were also presented as an example in his presentation. His presentation appeared in [Annex 21](#).

As for management of purse seine fisheries, Chief of MFRDMD informed the meeting that FMP for specific species is the main target for the future JTF project.

Capacity building for stock and risk assessment will be one of the activities proposed for this new project. In this regards, Indonesia representative strongly agreed that scientific data is needed to support FMP and recommended FMP at the national level (e.g. FMP in Cambodia and Thailand) should be developed before FMP at the regional level could be initiated. However, harmonization on the specific objective of FMP for pelagic fish should be considered as a high priority in terms of to stop overfishing and upgrade habitat for sustainable fishery.

Meeting also agreed to include other type of fishing gear (e.g. ring-net in Philippines or surrounding net in Thailand) that has similar function or mechanism as purse seine in the FMP. The meeting agreed, that MFRDMD as the center management for regional level should lead this activity.

24. A few points had been highlighted as for general discussions for management strategies such as:
 - i) Chief of MFRDMD suggested *Rastrelliger* spp and *Decapterus* spp need the management strategy for the region based from the finding of the shared stock. Example

such as close season practice in Thailand, Myanmar and Viet Nam could be taken as an example as the strategy for the sharing stocks among Member Countries.

ii) Member Countries need to get complete set of information on catch and effort in order to come up with a more reliable Purse Seine estimation in the region. This output will be used for final output for JTFVI program.

iii) MFRDMD will re-send the template for the data input and Member Countries were requested to give at least 20 years series of data according to two ecosystems; South China Sea and Andaman Sea. Member Countries will give fully support the proposal of FMP for Purse Seine Fisheries.

25. This session was chaired by Chief of SEAFDEC/MFRDMD, Mr. Raja Bidin Raja Hassan. Way forward were discussed and presented as below:

No.	Activities	Time frame	Remarks
1.	To collect complete set of information from MCs for Catch & Effort data for PS fishery	End of 2017	<ul style="list-style-type: none"> • MFRDMD will resend the template to MCs after this meeting • Include C&E data of ring nets (The Philippines) • Separate data according to the ecosystem (SCS and AS)
2.	Regional synthesis	Q1 of 2018	<ul style="list-style-type: none"> • MCs will submit the country report after the meeting • Involve one representative from MCs for workshop. • Will include the synthesis of total catch and species composition in the SCS and AS. • Data standardization
3.	Publication on current status of PS fishery	Q2 of 2018	
4.	Genetic study	Q3/Q4 of 2018	<ul style="list-style-type: none"> • Workshop for final report (invite delegates from Indonesia) • DNA barcoding to confirm cryptic species depends on the budget available
5.	CEM	Q4 of 2018	<ul style="list-style-type: none"> • Invite all MCs (two representatives)

VIII. CLOSING SESSION

26. Closing remark by Deputy Chief of SEAFDEC/MFRDMD. He conveyed his thanks to all the participants, resource person and secretariat of the meeting for their hard work and contribution to the workshop, which was very much helpful for upgrading the fisheries management in the region. His closing remarks appeared in Annex 22.



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(JAPANESE TRUST FUND VI)**



**Kuala Lumpur, Malaysia
12-14 September 2017**

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**THE 3rd CORE EXPERT MEETING ON “COMPARATIVE
STUDIES FOR MANAGEMENT OF PURSE SEINE FISHERIES
IN THE SOUTHEAST ASIAN REGION”
(JAPANESE TRUST FUND VI)**



**Kuala Lumpur, Malaysia
12-14 September 2017**

WELCOME REMARKS

by

**Dr. Kenji Taki
Deputy Chief of SEAFDEC/MFRDMD**

WELCOME REMARKS

Dr. Kenji Taki
Deputy Chief of SEAFDEC/MFRDMD

**The 3rd Core Expert Meeting on “Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region”
(12th – 14th September 2017, Furama Hotel, Kuala Lumpur, Malaysia)**

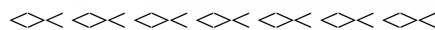
Chief of SEAFDEC/MFRDMD *Mr. Raja Bidin Raja Hassan*, our resource person, *Dr. Matsuishi* from Hokkaido-University, distinguished experts from participating Member Countries, Project Leader *Mr. Mohammad Faisal* and my colleagues from SEAFDEC/ SEC, TD, and MFRDMD, Ladies and Gentlemen, very good morning!

In opening the Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region, I would like to express my sincere appreciation to all of you for your participation in this meeting. And welcome to Kuala Lumpur, Malaysia.

As you have been well aware of, management of purse seine fishery is one of the biggest issues among the fisheries in ASEAN region. The purpose of the meeting is; to share the latest information about landings and CPUEs of purse seine fisheries in the region; to compile the current management measures for purse seine fisheries in the region; to share experience on data processing for management of purse seine fisheries, and to understand the population structure for *Amblygaster sirm*. Through these discussions, we are expecting to deepen our knowledge for Purse Seine management system which is more applicable in the ASEAN region.

Although it is only 2 and a half days meeting, I wish you all enjoy staying in Kuala Lumpur. There is a sky train station just in a walking distance from this hotel. You can easily take a visit to KLCC, Bukit Bintang, China Town and many other places. The meeting is expected to finish until lunch of the 3rd day, so you may have a time to enjoy KL.

Thank you very much again and wish you would have a good day.





**THE 3rd CORE EXPERT MEETING ON “COMPARATIVE
STUDIES FOR MANAGEMENT OF PURSE SEINE FISHERIES
IN THE SOUTHEAST ASIAN REGION”
(JAPANESE TRUST FUND VI)**



**Kuala Lumpur, Malaysia
12-14 September 2017**

OPENING ADDRESS

by

**Mr. Raja Bidin Raja Hassan
Chief of SEAFDEC/MFRDMD**

OPENING ADDRESS

Mr. Raja Bidin Raja Hassan
Deputy Chief of SEAFDEC/MFRDMD

The 3rd Core Expert Meeting on “Comparative Studies For Management of Purse Seine Fisheries in the Southeast Asian Region”
(12th – 14th September 2017, Furama Hotel, Kuala Lumpur, Malaysia)

Thank you Ms. Noorul. Assalamualaikum w.r.a and very good morning. *Dr. Kenji Taki*, Deputy Chief of SEAFDEC/MFRDMD, our Resource Person, *Professor Dr. Matsuishi*, distinguish delegates from SEAFDEC Member Countries, SEAFDEC Senior officers, Ladies and Gentlemen, Welcome again to Kuala Lumpur, our beautiful city of Malaysia.

On behalf of the organizing committee, I would like to extend our warm welcome to everyone to our “Core Expert Meeting on Comparative Studies for Purse Seine Fishery in the Southeast Asian region” starting from today and will be end on Thursday, 14 September 2017.

Small pelagic fishes are very important to us in the Southeast Asian region because it provides cheap protein source for our peoples. These resources are not only link to surface fishery gears, such as purse seine and gill net, but also bottom trawlers especially in the coastal areas. Pelagic fish is also considered as migratory species and shared among neighbouring countries in this region.

Due to these characteristic, pelagic resources need to be regionally managed in order to sustain their exploitation as well as their resources for future generation. As I did mentioned earlier, some species of pelagic are shared among neighbouring countries, so regional cooperation to manage this fishery is inevitable.

During this 3-days meeting, we are going to share the latest information about pelagic fisheries that would be presented by participating member countries and management of purse seine fishery. In addition some new concept or model may also addressed by our resource person/expert from Japan. It is important to examine the fishing capacity for Purse Seine and some management measures to address the common issues faced in this region. We are very fortunate, that our resource person from Japan, *Professor Dr. Matsuishi* is available and together with us, so I hope our delegates could tap valuable information presented by him during the meeting.

In addition, we are going to identify any shortcoming on the data submitted by each member country and if possible try to find a good solution so that SEAFDEC is able to help member countries to forecast quota for TAE or TAC for purse seine fishery in the South China Sea and Andaman Sea.

On behalf of the organizing committee, I would like to extend our gratitude and appreciation to all of you, who are able to attend our workshop and share experience and knowledge about the current purse seine fisheries status.

I am also would like to thank our meeting secretariat for their hard working to ensure our meeting run smoothly.

I am also hope everybody will take this opportunity to discuss freely with our expert and gain benefit as much as possible for better management of our fisheries. Lastly I hope you have an enjoyable stay in Kuala Lumpur and fruitful deliberation during the meeting.

In the name of Allah, the most Great and Merciful, I now declare our meeting officially open.

Thank you.





**THE 3rd CORE EXPERT MEETING ON “COMPARATIVE
STUDIES FOR MANAGEMENT OF PURSE SEINE FISHERIES
IN THE SOUTHEAST ASIAN REGION”
(JAPANESE TRUST FUND VI)**



**Kuala Lumpur, Malaysia
12-14 September 2017**

MEETING AGENDA

by

**Dr. Kenji Taki
Deputy Chief of SEAFDEC/MFRDMD**



**THE 3rd CORE EXPERT MEETING ON “COMPARATIVE
STUDIES FOR MANAGEMENT OF PURSE SEINE FISHERIES
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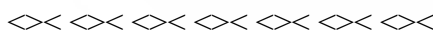


**Kuala Lumpur, Malaysia
12-14 September 2017**

PROVISIONAL AGENDA AND TIME TABLE

Day 1: 12 September 2017 (Tuesday)	
0830 – 0900	Registration
Agenda 1: Opening of the Meeting	
0900 – 0910	Welcome Remarks by Deputy Chief of SEAFDEC/MFRDMD
0910 – 0920	Opening Address by Chief of SEAFDEC/MFRDMD
Agenda 2: Adoption of Agenda and Overview of the Program Activity <i>Chairperson: Chief of SEAFDEC/MFRDMD</i>	
0920 – 0930	Adoption of the Agenda and Arrangement of the Meeting by Deputy Chief
0930 – 0950	Overview of project by Project Coordinator
Agenda 3: Country Report Presentations <i>Chairperson: Deputy Chief of SEAFDEC/MFRDMD</i>	
0950 – 1020	Group Photo and Refreshment
1020 – 1050	Cambodia
1050 – 1120	Indonesia
1120 – 1150	Malaysia – East Coast
1150 – 1220	Malaysia – West Coast
1220 – 1430	Lunch Break
1430 – 1500	Malaysia – Sarawak
1500 – 1530	Malaysia – Sabah
1530 - 1600	Refreshment
1600 - 1630	Myanmar
1630 - 1700	The Philippines
Day 2 : 13 September 2017 (Wednesday)	
0900 – 0930	Thailand
0930 - 1000	Viet Nam
1000 - 1030	General discussion of pelagic fisheries based on country presentations
1030 – 1100	Tea Break

Agenda 4: Review on current Purse Seine Management Systems (Thai & The Philippines) <i>Chairperson : Chief of SEAFDEC/MFRDMD</i>	
1100 - 1130	Presentation by Thailand on Experience and Lesson-Learned on TAC implementation.
1130 – 1200	Presentation by The Philippines on Experience and Lesson-Learned based on Target Reference Points (TRP).
1200 - 1245	General discussion on management of purse seine fisheries.
1245 – 1430	Lunch Break
Agenda 5: Regional Data Analysis <i>Chairperson : Deputy Chief of SEAFDEC/MFRDMD</i>	
1430 - 1500	Stock Assessment of Sardine in Japan – Dr. Matsuishi
1500 - 1530	Genetic study of <i>Amblygaster sirm</i> inferred by mitochondria DNA Cytochrome <i>b</i> in South China Sea and Andaman Sea – Ms. Wahidah Mohd Arshaad
1500 – 1600	Refreshment
1600 – 1700	General discussion on regional data analysis.
Day 3 : 14 September 2017 (Thursday)	
Agenda 6: Related to Management Strategy of Purse Seine Fishery <i>Chairperson: Ms. Mazalina of SEAFDEC/MFRDMD</i>	
0900 – 0945	Fishery Management of Small Tuna in Setnet fishery in Japan – Dr. Matsuishi
0945 – 1030	Fisheries Management Plan for Pelagic Fisheries – Chief of SEAFDEC/MFRDMD
1030 – 1100	Refreshment
Agenda 7: Closing of the Meeting <i>Chairperson: Chief of SEAFDEC/MFRDMD</i>	
1100 – 1200	General Discussion on Management Strategy
1200 - 1220	Way forward
1220 – 1230	Closing Remarks by Deputy Chief of SEAFDEC/MFRDMD
1230	Lunch and Check out





**THE 3rd CORE EXPERT MEETING ON “COMPARATIVE
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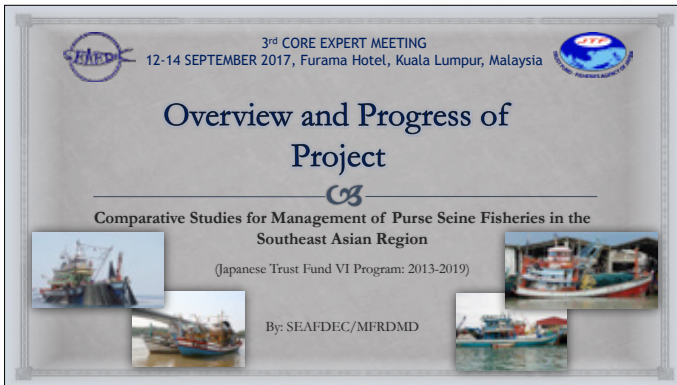
**Kuala Lumpur, Malaysia
12-14 September 2017**

Project Overview

Overview and Progress of Project

by

**Mr. Mohammad Faisal Md. Saleh
Project Coordinator
SEAFDEC/MFRDMD**



CONTENTS

- BACKGROUND OF THE PROJECT
- REVIEW ON AVAILABLE STATISTIC DATA
- PROGRESS OF THE PROJECT
- ISSUES AND RECOMMENDATION

CONTENTS

- BACKGROUND AND OVERVIEW
- REVIEW ON AVAILABLE STATISTIC DATA
- PROGRESS OF THE PROJECT
- ISSUES AND RECOMMENDATION

Background

- ❖ Small pelagic fishes such as Indian mackerels, scads and sardinellas are very important in the Southeast Asian region, not only for food resources, but also for employment and livelihood of fishers.
- ❖ Purse seine is one of the major fishing gears to catch those small pelagic fishes.
- ❖ Although formulation of a management plan is required for sustainable use of these resources, management of PS fisheries is still neglected because information of stocks is lacking.
- ❖ Therefore, we need to develop the best way to assess the size and state of the stocks for accurate TAC allocation and to find the most applicable management system for the PS fisheries in the region.
- ❖ Also, effective management of shared stocks requires management measures to be taken for the whole coverage area that is beyond national waters.

Overview

- ❖ The project involves compilation and comparison of annual and/or monthly CPUE to examine the trend of resource level for the last three decades in the region.
- ❖ MFRDMD will compare purse seine fisheries management systems including TAC systems and other management measures in the world and conduct the genetic study of a commercially important pelagic species.
- ❖ At the end of the project, MFRDMD will review available information including stock levels, and MFRDMD and member countries will examine applicable management strategies for sustainable purse seine fisheries in the Southeast Asian region

Objectives

1. To compile and compare annual and/or monthly catch per unit effort (CPUE) data for the last three decades in SEA region,
2. To assess unit of effort and to examine other indicators for stock assessment,
3. To compare existing management systems/measures of PS fishery which is applicable for management of PS fishery in the region,
4. To compare genetic structures of commercially important small pelagic species in the region,
5. To propose management strategies for sustainable PS fisheries.

Expected Final Goals of the Project

1. To contribute for the formulation of management strategies for small pelagic fish fisheries in the region;
2. To provide monitoring tools for pelagic fishery resources in the region.

- ### Activities
1. Comparative Studies for CPUE and TAC
 - 1.1 Case studies for CPUE in the Southeast Asian region
 - 1.2 Suitable CPUE and other indicators for resource levels in member countries
 - 1.3 Comparison of TAC systems in the world (including other management measures)
 2. Genetic Data Collection and Analysis
 - 2.1 Equipment preparation for genetic study
 - 2.2 Sample collection
 - 2.3 Genetic study
 - 2.4 Data compilation and analysis
 3. Meetings for Effective Program Implementation
 - 3.1 Core Expert Meeting/ Workshop
 4. Recommendation for Purse Seine Fisheries Management in the SEA region
 - 4.1 Recommendation for fisheries management
 - 4.2 Preparation and publishing of terminal report

Budget

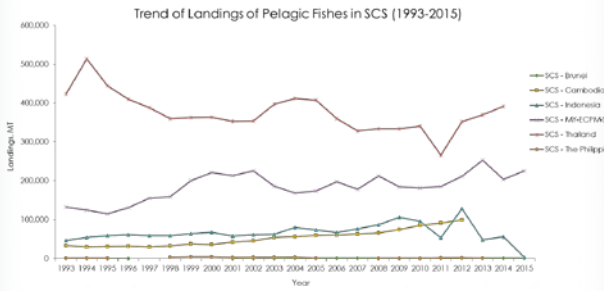
Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017	Y6 2018	Y7 2019
1: Comparative Studies for CPUE and TAC	1.1 Case studies for CPUE in the Southeast Asian region	20,000	5,000					
	1.2: Suitable CPUE and other indicators for resource levels in member countries			10,000	6,500			
	1.3 : Comparison of TAC systems in the world (including other management measures)	25,000	5,000	10,000	6,500	7,933	8,933	
2: Genetic Data Collection and Analysis	2.1 Equipment preparation for genetic study	15,000						
	2.2: Sample collection		8,000	5,000				
	2.3: Genetic study		9,866	15,972	9,773			
	2.4: Data compilation and analysis					5,000		
3: Meetings for Effective Program Implementation	3.1: Core Expert Meeting/Workshop		30,394		25,000	21,000	25,000	
	4: Recommendation for Purse Seine Fisheries Management in the Southeast Asian region							3,933
	4.2: Preparation and publishing of terminal report							30,000
Sub-Total Budget		60,000	58,260	40,972	47,773	33,933	33,933	33,933

CONTENTS

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COMPARATIVE STUDIES FOR CPUE AND TAC

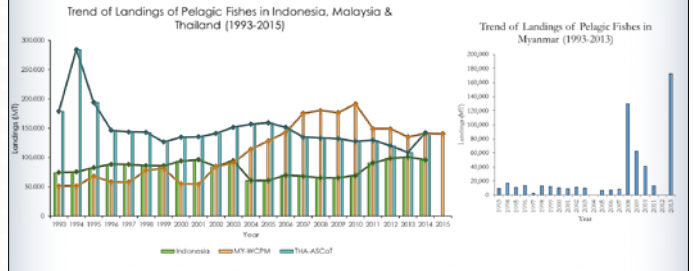
Trend of Landings (South China Sea)



Sources: a. BRU : Statistic provided by country 1993-1996, 2001-2015 for JTF6 project
 b. INDO : Statistic provided by country 1993-2012 for JTF6 project
 c. INDO : Statistic provided by country 1993-2015 for JTF6 project
 d. MAL : Annual Fisheries Statistics 1993-2015
 e. TH : Statistic provided by the country 1993-2014 for JTF6 project
 f. PHIL : Current Status of Purse Seine Fisheries in the South East Asia 2015

COMPARATIVE STUDIES FOR CPUE AND TAC

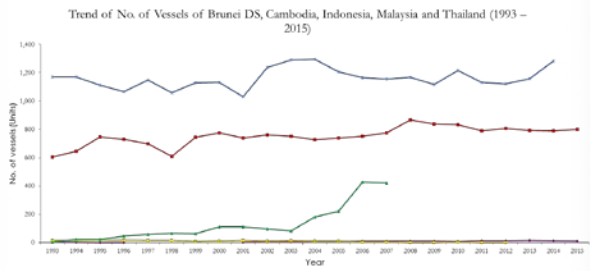
Trend of Landings (Andaman Sea)



Sources: a. MAL: Annual Fisheries Statistics 1993-2015
 b. TH: Statistic provided by the country 1993-2014 for JTF6 project
 c. INDO: Statistic provided by the country 1993-2014 for JTF6 project
 Source: Fishery Statistical Bulletin of Southeast Asia (1993-2013)

COMPARATIVE STUDIES FOR CPUE AND TAC

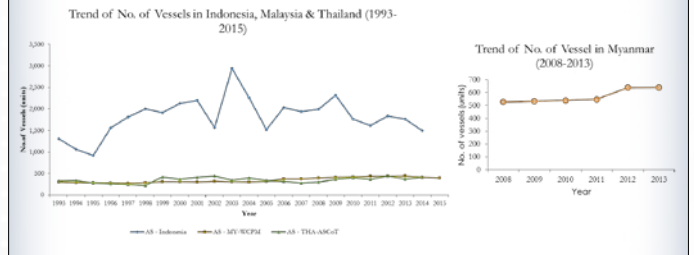
Trend of Fishing Effort (South China Sea)



Sources: a. BRU : Statistic provided by country 1993-1996, 2001-2015 for JTF6 project
 b. INDO : Statistic provided by country 1993-2012 for JTF6 project
 c. INDO : Statistic provided by country 1993-2007 for JTF6 project
 d. MAL : Annual Fisheries Statistics 1993-2015
 e. TH : Statistic provided by the country 1993-2014 for JTF6 project

COMPARATIVE STUDIES FOR CPUE AND TAC

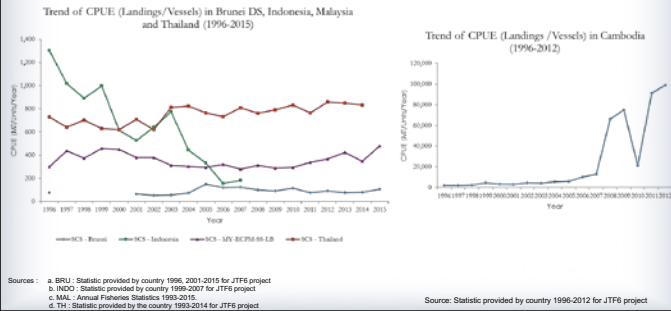
Trend of Fishing Effort (Andaman Sea)



Sources: a. MAL: Annual Fisheries Statistics 1993-2015
 b. TH: Statistic provided by the country 1993-2014 for JTF6 project
 c. INDO: Statistic provided by the country 1993-2014 for JTF6 project
 Source: Fishery Statistical Bulletin of Southeast Asia (2008-2013)

COMPARATIVE STUDIES FOR CPUE AND TAC

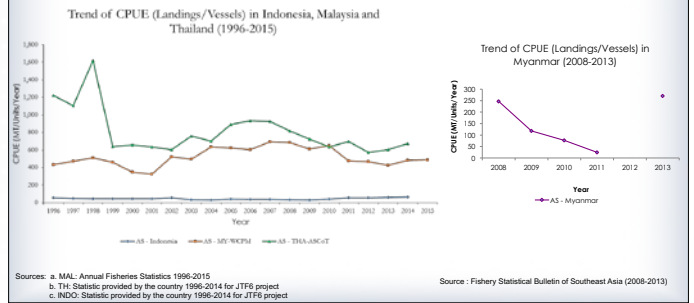
Trend of CPUE (South China Sea)



Sources: a. BRU : Statistic provided by country 1996, 2001-2015 for JTF6 project
 b. INDO : Statistic provided by country 1999-2007 for JTF6 project
 c. MAL : Annual Fisheries Statistics 1993-2015
 d. TH : Statistic provided by the country 1993-2014 for JTF6 project
 Source: Statistic provided by country 1996-2012 for JTF6 project

COMPARATIVE STUDIES FOR CPUE AND TAC

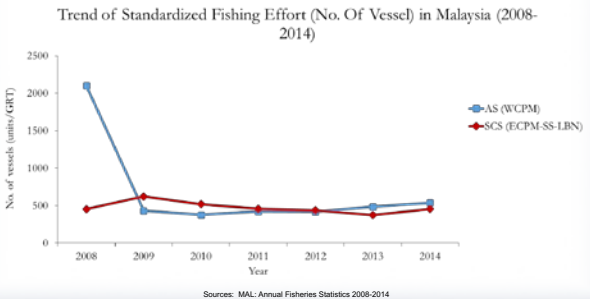
Trend of CPUE (Andaman Sea)



Sources: a. MAL: Annual Fisheries Statistics 1996-2015
 b. TH: Statistic provided by the country 1996-2014 for JTF6 project
 c. INDO: Statistic provided by the country 1996-2014 for JTF6 project
 Source: Fishery Statistical Bulletin of Southeast Asia (2008-2013)

COMPARATIVE STUDIES FOR CPUE AND TAC

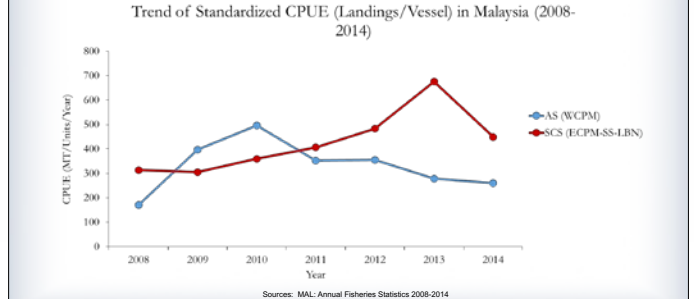
Trend of Standardized Fishing Effort Case study of Malaysia



Sources: MAL: Annual Fisheries Statistics 2008-2014

COMPARATIVE STUDIES FOR CPUE AND TAC

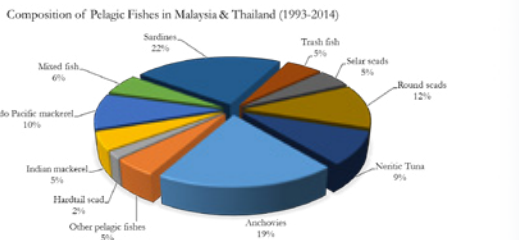
Trend of Standardized CPUE Case study of Malaysia



Sources: MAL: Annual Fisheries Statistics 2008-2014

COMPARATIVE STUDIES FOR CPUE AND TAC

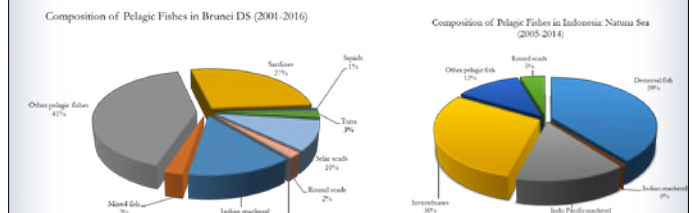
Composition of pelagic fishes (South China Sea)



Note:
 1. Malaysia 1. Bigeye scad, Yellowtail scad, Spanish mackerel are grouped into other pelagic fishes as the species are not available in the GoT.
 2. Malaysia & GoT: Cuttlefishes and squids are grouped into other pelagic fishes due to catch data less than 1% from total.
 Sources: a. MAL : Annual Fisheries Statistics 1993-2014.
 b. TH : Statistic provided by the country 1993-2014 for JTF6 project

COMPARATIVE STUDIES FOR CPUE AND TAC

Composition of pelagic fishes (South China Sea)

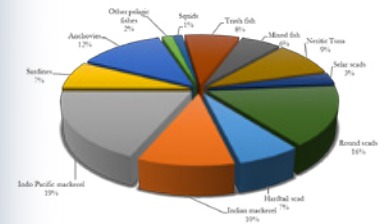


Source : Statistic provided by country for JTF6 project, 2001-2016
 Source : Statistic provided by the country for JTF6 project, 2005-2014.

COMPARATIVE STUDIES FOR CPUE AND TAC

Composition of pelagic fishes (Andaman Sea)

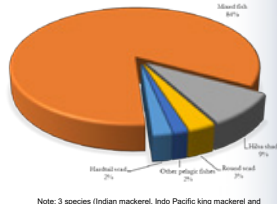
Composition of Pelagic Fishes in Malaysia & Thailand (2000-2014)



Note: For Malaysia, Bigeye scad, Yellow-striped scad and Spanish mackerel were grouped into other pelagic fishes since Thailand have a small catch of these 3 species.

Sources: a. MAL - Annual Fisheries Statistics 2000-2014.
b. TH: Statistic provided by the country 2000-2014 for JTRB project

Composition of Pelagic Fishes in Myanmar (2008-2013)



Note: 3 species (Indian mackerel, Indo Pacific king mackerel and Squid) are included in Other pelagic fishes group due to data less than 1% from total catch.

Source: Fishery Statistical Bulletin of Southeast Asia (2008-2011, 2013)

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ISSUES AND RECOMMENDATION

Current Statistic Data Collected

PARAMETERS	REGION	SCS	SCS	SCS	AS	SCS	AS	SCS	SCS	AS	SCS	
	COUNTRY	BRU	CAM	IND07H	IND037H	TH-GOT	TH-AS	PHI	MV-SCS	MAS-AS	MYM	VN
Landing of Purse Seine Fisheries	Trend of Landing	√	√	√	√	√	√	√	√	√	√	√
	Sp. Composition	√	√	√	√	√	√	√	√	√	√	√
	Biological information ¹⁾ / Spawning Season	√	√	√	√	√	√	√	√	√	√	√
Fishing effort for Purse Seine Fisheries	No. of PS vessels (PPS, APS)	√	√	√	√	√	√	√	√	√	√	√
	No. of PS vessels (GRT)	√	√	√	√	√	√	√	√	√	√	√
	No. of days/trip	√	√	√	√	√	√	√	√	√	√	√
	No. of trips/month	√	√	√	√	√	√	√	√	√	√	√
	No. of hands/days	√	√	√	√	√	√	√	√	√	√	√
Trend of CPUE	by vessel	√	√	√	√	√	√	√	√	√	√	√
	by trip	√	√	√	√	√	√	√	√	√	√	√
	by days	√	√	√	√	√	√	√	√	√	√	√
Status of Purse Fish Stock	Biomass	√	√	√	√	√	√	√	√	√	√	√
	MSY	√	√	√	√	√	√	√	√	√	√	√
Existing management strategies	Close Season	√	√	√	√	√	√	√	√	√	√	√
	Close Area	√	√	√	√	√	√	√	√	√	√	√
	Survey/monitoring program	√	√	√	√	√	√	√	√	√	√	√
	Joint vessel program	√	√	√	√	√	√	√	√	√	√	√

¹⁾Note: √ : data not available yet

Purse Seine Fisheries Management

- MFRDMD consulted with an expertise from Japan (Dr. Matsuishi)
 - Study on "Sustainable Fishery Management - latest movement in Japan" (08 March 2015, MFRDMD)
 - Discussion on "Total Allowable Effort (TAE) System and Possibility for its Application to the Management of Purse Seine Fishery in the ASEAN region" (19 Nov 2015, MFRDMD)
 - Discussion on "Total Allowable Effort (TAE) system and Possibility for its Application to the Management of PS Fishery in the ASEAN region" (18 Nov 2016, Hokkaido University)
- MFRDMD conducted internal workshop in Tok Bali, Malaysia to discuss regional synthesis of PS fisheries information (6-7 January 2016).

Comparative Studies of CPUE and TAC

- MFRDMD has convened a regional workshop on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region at Kuala Lumpur, Malaysia (7-8 March 2017)
- During this workshop, the resource person (Dr. Matsuishi) introduced new options for PS fisheries management in the SEA region namely the ABC and ABE strategies. These strategies are more suitable for multispecies situation.
- Feedback control (Rule 2-1 and Rule 2-2) are being considered as the most applicable for purse seine.



Genetic Data Collection and Analysis

- Genetic samples from spotted sardinella (*Amblygaster sirm*) collected by participating member countries were analyzed and the preliminary result based on four sampling locations (Muara, Kuantan, Kudat, Songkla) was presented during the 2nd Core Expert Meeting in 2016.
- The preliminary results found that *Amblygaster sirm* in South China Sea is a single evolutionary unit and therefore can be regarded as a single conservation unit for the management of sustainable fisheries.



Amblygaster sirm

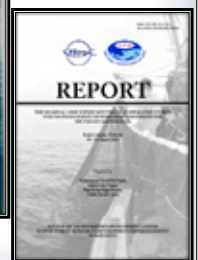
Meetings for Effective Program Implementation

- ✓ "CEM on Comparative Studies for Management of PS Fisheries in the SE Asian Region", 26-28 Aug 2014, Kuala Lumpur, Malaysia
- ✓ "CEM on Comparative Studies for Management of PS Fisheries in the SE Asian Region", 9-11 Aug 2016, Kuala Lumpur, Malaysia.
 - ✓ The meeting shared the latest information about landings and CPUEs of PS fisheries in the region, made comparison on application of TAC, TAE and other management options as well as its data requirement, and understanding the population structure for *Amblygaster sirm*.



Compilation of Current PS Management

- Information of Fisheries, Biology Fishing Effort, and Management in AMSS are compiled both in the AS and SCS.
- List of complete publication:
 1. "Current Status of Purse Seine Fisheries in the Southeast Asian Region" was published in 2015.
 2. Current status of Pelagic Fisheries in the Southeast Asian Region (Fish for The People, 2015).
 3. Meeting report for "Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region. (2nd CEM, 2016).



CONTENTS

BACKGROUND AND OVERVIEW

REVIEW ON AVAILABLE STATISTIC DATA

PROGRESS OF THE PROJECT

ISSUES AND RECOMMENDATION

Issues and Challenges

1. Commitment from member countries to send related data to MFRDMD.
2. Statistical data
 - Uniformity of data
 - Each country has its own statistical data collection system, thus can not compare directly.
 - Data have been sent did not follow the standard requirements or format in the provided template.
 - Insufficient statistical data – shortage of human resources (manpower) to develop a systematic data collection
 - Data reliability and validity
3. Different management strategies
 - Data are not categorised by species
 - Fishing zonation
 - Different classification of fishing gear
4. Genetic study of *Amblygaster sirm*
 - Difficulties in bureaucratic procedures and legislations to bring samples from countries to MFRDMD, which makes regional genetic studies interrupted.
 - Misidentification of some samples sent from MCs, showing some MCs has still have difficulties in species identification of small pelagic species.

Recommendation for Purse Seine Fisheries Management in the Southeast Asian Region



- ❖ Expected Output of this Project
 - To Present **Recommendations** for Purse Seine Fisheries Management in the Region
 - To Publish a **Terminal Report**
- ❖ 2017: CEM
 - To further discuss and update on the current status of purse seine fisheries in the SCS and AS as well as the result of genetic study.
- ❖ 2018: CEM
 - To draft recommendations
- ❖ 2019: Terminal Meeting:
 - To compile updated information of PS Fisheries and Management in the ASEAN Region
 - To finalize recommendations

THANK YOU





**THE 3rd CORE EXPERT MEETING ON “COMPARATIVE
STUDIES FOR MANAGEMENT OF PURSE SEINE FISHERIES
IN THE SOUTHEAST ASIAN REGION”
(JAPANESE TRUST FUND VI)**



**Kuala Lumpur, Malaysia
12-14 September 2017**

***Country Presentation*
CAMBODIA**

Purse Seine Fishery in Cambodia

by

**Dr. Chea Tharith
Presenter
Deputy Director of Marine Fisheries
Research and Development Institute, Cambodia**

PURSE SEINE FISHERY IN CAMBODIA

12-14 September 2017, FURAMA Hotel, Kuala Lumpur, Malaysia

Prepared by
Chea Tharith

Marine Fisheries Research and Development Institute
Fisheries Administration (Cambodia)

Overview

- Area: 181,035 km²
- Wetlands: >30%
- Inland production: 570,000 tones
- The marine sub-sector: 120,500 tones, contributes 14-16% of total each year
- Aquaculture: 71,610 tones



2

Overview

- Cambodia's fisheries provide full-time, part-time and seasonal employment for up to 6 million people.
- Fisheries production is estimated to be worth around US\$200-300 million per year, fisheries harvesting, processing and trade contributes 8-12% of GDP.
- Value of fish exports about US\$ 100 million per year.
- It provides over 81.5% of the animal protein in the national diet.



Marine Waters in Cambodia

Coastline of the country is 435 Km:

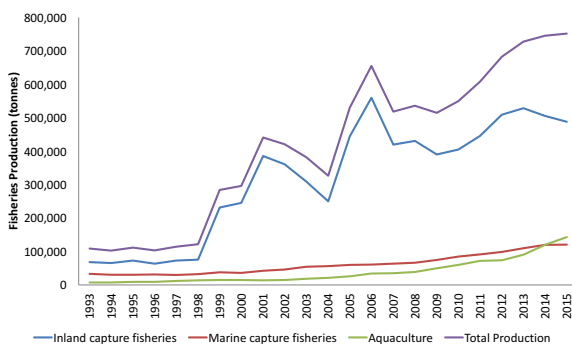
- ☐ Koh Kong - 237 Km
- ☐ Preah Sihanouk- 175.81 Km
- ☐ Kampot- 67 Km
- ☐ Kep- 26.50 Km

Kingdom of Cambodia:

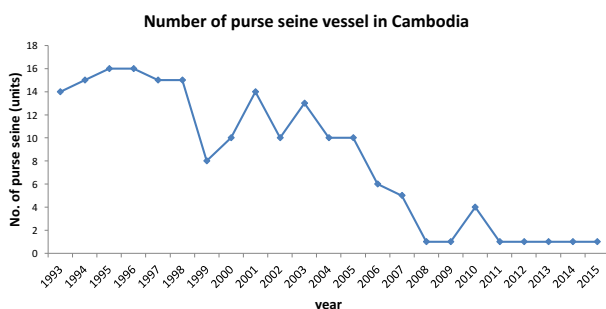
- ❖ Exclusive Economic Zone (EEZ) the area extended from the shoreline to 200 nautical miles, covers 55,600 Km²



The marine sub-sector contributes 14-16% to this total production each year and is now just over 120,000 tonnes.



PURSE SEINE FISHERIES



Fishing Areas

In the Tobnob Rolork (Shihanoukville) and in Veal Renh Bay (Kampot) provinces. Three purse seine boats, which one in Kampot and two in Sihanoukville, mostly boats operated in the coastal zone between of depth of water ranged 10-25 m.

Sampling period

Sampled from January to December in 2003-2004

Sampling frequency

Boats purse seine operated about 2-5 days per trip, and 9-10 trips per month

Fishing Areas



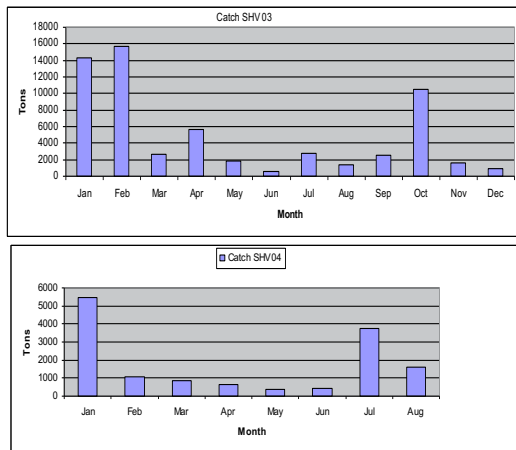
Figure. Map of tracking of BBO vessel in Sihanoukville

Fishing vessel

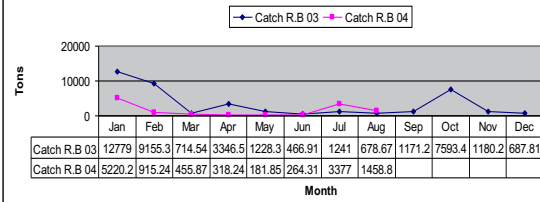


Figure. Fishing vessel of purse seine operation in Sihanoukville

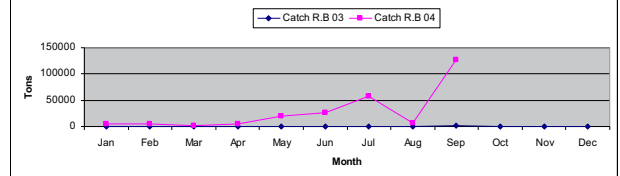
Catch from long-tailed boat



Catch Species-SHV-Year 03 & 04



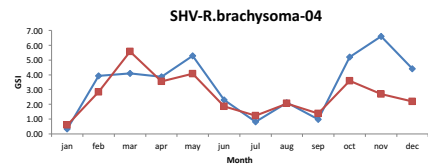
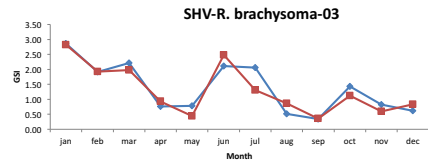
Catch Year 03 & 04 of R.B



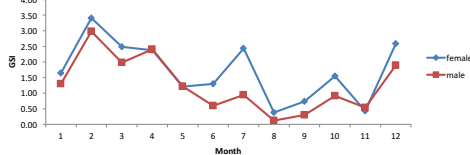
Type of Purse Seine fisheries

Purse seine	Boat	Location
Scad, Sardine, <i>Rastrelliger</i> spp., Anchovy	Loa: 20 m	Tomnop Rolk
Anchovy purse seine	ph: 350	Sihanoukville
Scad, Sardine purse seine	Loa: 18 m	
	ph: 190	
	Loa: 17 m	
	ph: 300	

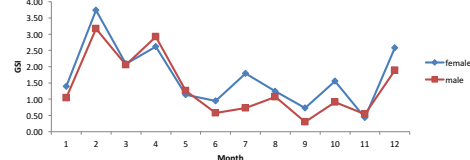
Biological information (length at first maturity, spawning season)



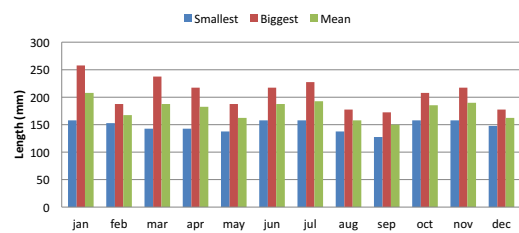
Kamp-R.brachysoma-03



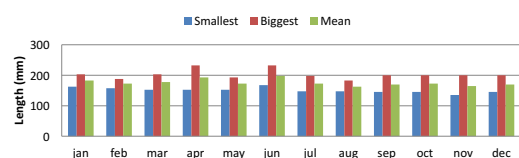
Kamp-R.brachysoma-04



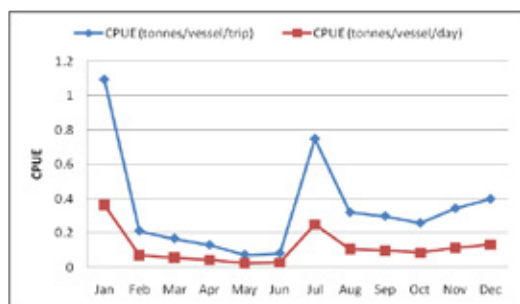
Length of R.brachysoma in Sihanoukville (mm) 2003



Length of R.brachysoma in Sihanoukville (mm) 2004

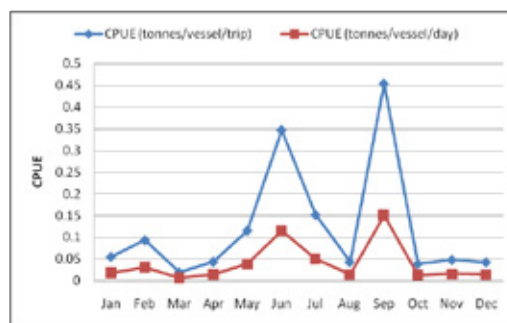


Trend of CPUE by graph (by vessel, trips, days)



CPUE of purse seine in Sihanoukville 2004

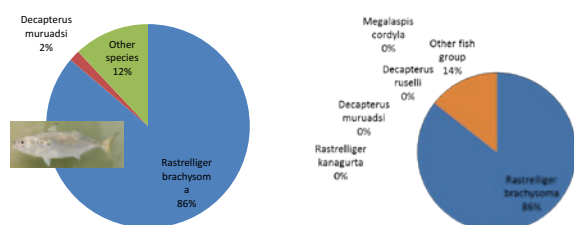
Trend of CPUE by vessel, trips, days



CPUE of purse seine in Kampot 2004

Catch composition in Tomnol Ro Lork (Sihanoukville) from June to December 2003-04 shown Short Mackerel (*Rastrelliger brachysoma*) species 86%, followed by *Decapterus muruadsi* (2%), other species 12%.

Kampot, 2003 *R. brachysoma* 86%, other species was 14%, and 2004 *R. brachysoma* comprised 63%, other species 37%.



Spawning (area, season)

- Local knowledge of small pelagic fish Short Mackerel (*Rastrelliger brachysoma*) in Cambodia shown the peak of the spawning season in January and March.
- The post spawning phase from September to December
- Yearly closed season of Mackerel is between January and March.

Problems and constraint

- Fishery resources are declining (diversity)
- Number of boats small-scale are increasing
- Small-scale boats are becoming motorized
- Catch per boat is either staying the same because of the increase in technology.
- Purse seine vessels had decreased
- Lack of methodology for Determining TAC for Purse Seine
- Lack of specialist/expertise on (TAC, TAE, MSY and CPUE)

Suggestions

- Strengthen knowledge science based development of fisheries through enhancing the national capacity in the data collection
- Need capacity building on stock assessment, MSY and CPUE
- Need training on methodology for Determining TAC

Thank you for your kind attention



**THE 3rd CORE EXPERT MEETING ON “COMPARATIVE
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IN THE SOUTHEAST ASIAN REGION”
(JAPANESE TRUST FUND VI)**



**Kuala Lumpur, Malaysia
12-14 September 2017**

***Country Presentation*
INDONESIA**

Small Pelagic Purse Seine Fisheries Status in Natuna Sea and Adjacent Waters

by

Mr. Imron Rosyidi

Mr. Suwarso

Presenter

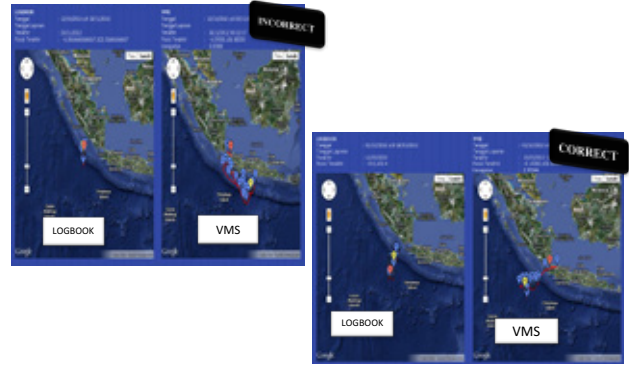
Ministry of Marine Affairs and Fisheries, Indonesia

SYSTEM INFORMATION FOR FISHING LOGBOOK (SILOPI)



17

LOGBOOK VALIDATION BY VMS DATA



18

- South China Sea (NATUNA SEA; covers 577,000 km²) is a continental shelf belong to the western part of Sunda Shelf; associated with Strait of Karimata in south part, and Java Sea. Flat bottom. Stratification of water masses by seasons (Wyrki, 1961). Average depth: 70 meters
- Hundreds of small islands in the northern part of bordering area (Riau Isl. Prov.)
- Natuna Sea is one of productive fishing grounds with Small Pelagic & demersal fish as main contributors in annual landing



PURSE SEINE FISHERY



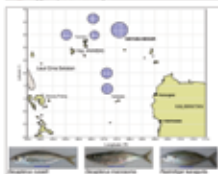
- Exploitation of small pelagic resources in SCS proceeded since 1970, mostly by gillnet (one day fishing)
- In the recent year, the exploitation was increased very fast, especially in West Kalimantan
- **Exploitation by PURSE SEINERS:**
 - 1) **PS Pontianak & Pemangkat** (start in 1986 with 30 units Medium PS). In 2000 is increase to 110 units.
 - 2) **Javanese PS** (Medium & Big PS) (from Central Java) are fishing in SCS during Southeast monsoon period (May-Sep)
 - 3) **PS North Sumatera** (Tanjungbalai)
- No. of PS in SCS is 2526 unit (DGCF, 2015)
- In 2002, the total catch of small pelagic fish about 99,242 ton which consisted of round scads, mackerels, sardines, bigeye scads, etc.

FISHING AREAS



PURSE SEINE - PEMANGKAT

- P. Midai, P. Timou
- Expansion > Natuna Besar Islands, Selor Isl., Panjang Isl.
- In Tanjung Satai (southern part of West Kalimantan) Mini PS exploit Mackerel



JAVANESE PURSE SEINE

- Basis in **Central Java**: Tegal, Pekalongan, Juana
- Fishing ground – more oceanic

DESIGN OF OF PURSE SEINE



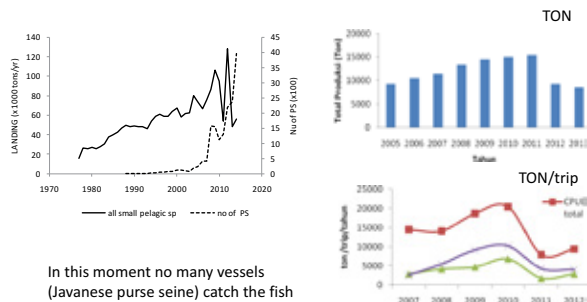
PS PEMANGKAT:

- Net-length 450-750 m; Width 42 m; Mesh-size 1 inch; Crews 20-25 people; Days at sea 11-20 days; usually with Carrier. Lamps: Spot-light (60 pc @ 400 Watt) & bulb-lamp (12 pc @ 1500 Watt)
- Species Target: Scads, Mackerel, sardine, etc.

MINI PS TANJUNG SATAI:

- Net-length 600-750 m; Width 28-35 m; Mesh-size 1 - 1½ - 1¼ inch; Daily fishing
- Species Target: Mackerel

LANDING OF PURSE SEINE Pemangkat

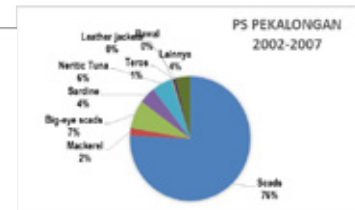
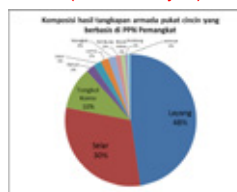


In this moment no many vessels (Javanese purse seine) catch the fish in Natuna Sea (in management)

SPECIES COMPOSITION

- Annual and seasonally species composition vary
- 2014. **Dominant species** : Scads 48% ; Big-eye scads & Trevally 30% ; Neritic Tuna 10%
- 2 **Species of Scads**: D. russelli & D. macrosoma
- 2 **Species of Neritic Tuna**: Kawa-kawa & Long-tail Tuna
- 2014: **Lower contribution (%) of Scads; Higher for Big-eye scads & Neritic tuna**

2014 (National Project)

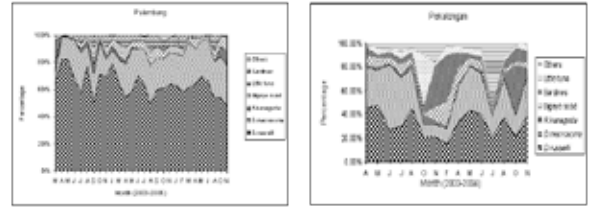


2003-2005 (Seafdec)

SPECIES (%)	Pemangkat	Palembang	Pekalongan
D. russelli	27	63	34
D. macrosoma	24	23	32
S. crumenophthalmus	24	6	6
R. kanagurta	2	2	2
Sardine	5	-	5
Neritic Tuna	9	5	4
Others	9	1	17

More landed of D. macrosoma in Pekalongan
Fishing grounds more oceanic

Seasonal Variation of Species Composition
2003-2005
(Seafdec Project)



REPRODUCTION ASPECTS

- Biological sampling in 2014-2016
- Examination to Female adult fish (> 15 cm FL)
- Obtaining Lm: I+II > Immature ; III+IV+V > Mature
- Random sampling with proportional by length-class
- Summary data for obtain Lm:

2014

Spesies	Maturity Stage					N
	I	II	III	IV	V	
D. russelli	9.3	30.7	36.1	13.4	10.6	659
R. kanagurta	30.1	14.2	40.7	10.2	4.9	496
S. crumenophthalmus	14.4	28.3	50.4	6.6	0.4	862

2016

Spesies	Maturity Stage (%)					N
	I	II	III	IV	V	
D. russelli	9.2	31.5	38.6	17.6	3.2	659
S. crumenophthalmus	1.6	23.2	56.8	1.6	2.4	750
R. brachysoma	0,9	2,8	67,3	28,9	0	211

Length at First Maturity (cm FL)

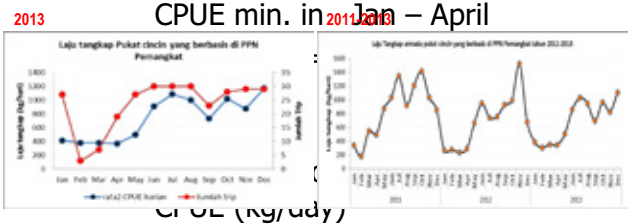
	2014	2016	2003-2005
D. russelli	20.3	17.4	18.6 & 21.2
D. macrosoma			20.5
S. crumenophthalmus	22.4	19.1	
R. kanagurta			20.4
R. brachysoma		15.0	

Spawning season

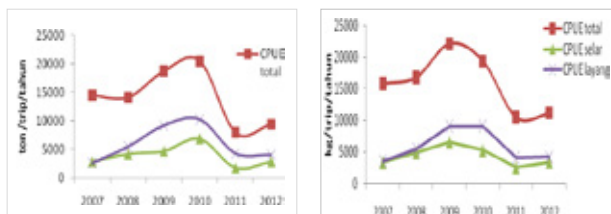
- 2014 & 2016: Round scad: after July; Big-eye scad: after May; Mackerel: after May
- 2003-2005: Occured within several months, from the end of southeas monsoon (July-August) until inter-monsoon

CPUE

- 2013 : CPUE = 13 ton/trip = 695 kg/day (range 5.3-20 ton/trip atau 400-1.1 ton/day) (PS Pemangkat, 2013). CPUE max. in July & Dec; CPUE min. in 2011 Jan - April

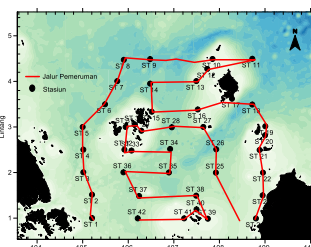


Annual trend of CPUE (ton/trip)



STATUS OF PELAGIC FISH STOCK

Acoustic Survey:



30 days cruise survey by MV. Madidihang 02 (163 tons). May 2016

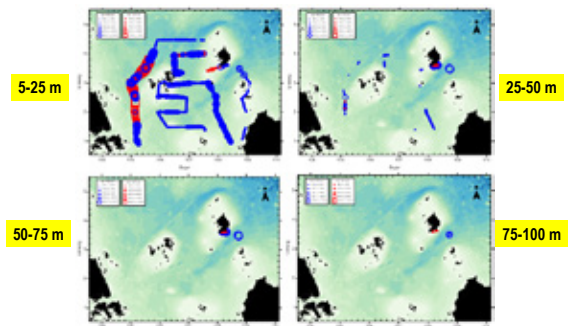
- DATA RECORDING: use Portable Scientific Echosounder SIMRAD EK-80
- Parameters setting: Frequency 200 KHz
- Systematic parallel transect
- Vessel Speed: 6 knot
- DATA ACQUISITION: covered from 5 – 150 m depth
- RAW DATA collected: Target strength (TS) & back-scattering coefficient areas (s_a) (echogram of backscattering strength) <> automatically & real time record
- Raw Data in digital file (.raw)

Data Analyses & Results

- **ACCOUSTIC ANALYSIS:** Refer to MacLennan & Simmonds (2005), Hannachi, *et, al.* (2004), Bertrand & Josse (2000)

Depth Strata (m)	Biomassa (tons)		MSY (tons/year)	
	Large Pelagic	Small Pelagic	Large Pelagic	Small Pelagic
5-25	4,782	192,674	2,391	96,337
25-50	776,122	221,514	388,061	110,757
50-75	0	13,641	0.0	6,820
75-100	0	0.5	0.0	0.3
Demersal				
Sub Total	780,904	427,830	390,452	213,915
Total	1,329,870		664,935	

Horizontal distribution of Pelagic Fish Density (fish/1000 m³) in 4 depth layer (2016)



0 -25 m:

- High Density around Anambas & Natuna. Depth Strata 0-25 m have highest contribute to Total Biomassa (0-150 m)

25 – 50 m :

- Higher Density detect around Natuna & a part of Anambas (near land)

50-75 & 75 – 100 :

- Lower Density almost in all location, decreasing by the depth. The density also detect around Anambas & P. Natuna

TERIMA KASIH

Kritik, Saran dan Masukan akan diterima dengan senang hati



**THE 3rd CORE EXPERT MEETING ON “COMPARATIVE
STUDIES FOR MANAGEMENT OF PURSE SEINE FISHERIES
IN THE SOUTHEAST ASIAN REGION”
(JAPANESE TRUST FUND VI)**



**Kuala Lumpur, Malaysia
12-14 September 2017**

***Country Presentation*
MALAYSIA**

Country Report on Purse Seine Fisheries in the East Coast Peninsular Malaysia

by

**Mr. Sallehudin Jamon
Senior Research Officer
FRI Kg. Aceh, Perak, Malaysia**



**The Core Expert Meeting Comparative Studies for Purse Seine Fisheries in the Southeast Asian Region
12 – 14 September 2017, Kuala Lumpur, Malaysia**

Country Report:
Malaysia – East Coast of Peninsular Malaysia

**Introduction
Malaysia fisheries profile**

Marine fishing areas in Malaysia can be divided into several fishing sub-areas:-

- West (Malacca Straits)
- East coast (South China Sea) of Peninsular Malaysia,
- Sarawak (South China Sea),
- West Sabah (South China Sea)
- East Sabah (Sulu and Celebes Seas.

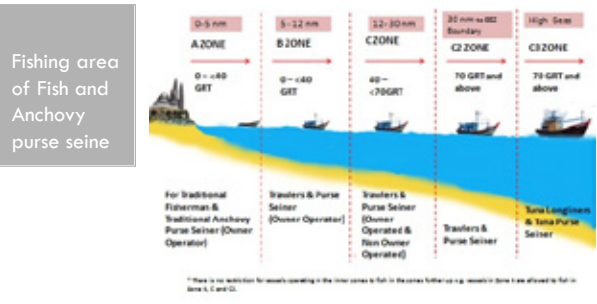


The E & C PM are different. ECPM faces SCS, has a sandy bottom due to the presence of patchy coral reef that occur along the coast. ECPM subject to severe weather during the north-east monsoon (Nov-Mar), during which no fishing – (except prawn trawling)

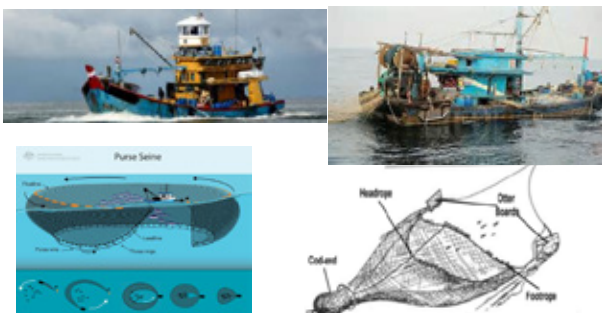
Introduction

- 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
- The marine capture fisheries can be categorized into two main types, namely coastal or inshore fisheries, and offshore fisheries
- Various types of fishing gear used by the fishermen. -trawl, fish purse seine, driftnet, gill net - and traditional fishing gear, including hook-and-line, bag net, trammel net, lift net and traps. However, the fishing gear that contribute the bulk of the landings are trawls, purse seines, driftnets and gill nets.

Fish Zones



Types of Fishing Gear



Purse Seines-(Design and size of fishing gear and fishing vessel)

- PS Vessel Categorized based on their gross tonnage
 - <10 GRT
 - 10 -24.9 GRT
 - 25 – 39.9 GRT (above 5 nm off shore)
 - 40 – 70 GRT (12 nm off shore) and
 - Above 70 GRT (above 30 nm offshore)



Continue...Purse seine fisheries.....

- Major fishing gear used to exploit the pelagic fish resources.
- Two main types –
- **Fish purse seine**
 - The fish purse seine, which is used to catch small pelagics,
 - operated with or without fish aggregating devices (FADs),
 - The catching efficiency increased by using spotlights and sonar
- **Anchovy purse-seine,**
 - which is used to catch anchovies in the coastal waters.

Anchovy Purse seine

- Without spotlights
- With spotlights



Anchovy Purse seine

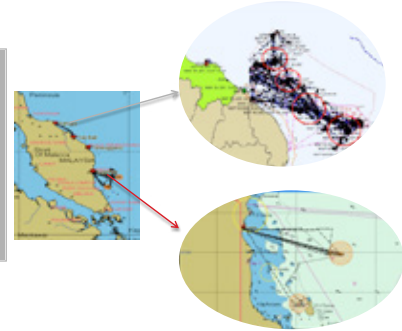
Anchovy PS	Anchovy PS-Light
1. Day operation (0800 – 1700)	1. Night Operation (1700 – 0800)
2. Searching school of fish	2. Attract by light
3. Length net -915 meter, Width 146 meter	3. Length 73 meter), Width -31 - 36 meter
4. No of krew 25	4. No of krew 7 – 15



Fishing area

Source:

- Information Collection for Sustainable Pelagic Fisheries in the South China Sea 2006
- Fisheries Resources Survey-Tuna



Management measures for purse seine fisheries

- One of the goals of fisheries management is to achieve sustainable coastal fisheries
- The management measures that have been implemented through the legal and institutional framework to control fishing effort include :

A. direct limitation of fishing effort =

- Licenses for Zone A, B and C are no longer issued.
- Application for permits for C2 (Deep Sea) zone is no longer issued.
- Applications for permits for C3 (International Sea Waters) permits are still permitted.

Continue- Management measures.....

B. Controls on size and power of fishing vessels

Any attempt by fishermen to change the tonnage or engine power of fishing vessels requires permission from the Director-General of Fisheries.

C. Registration of fishermen

This programme controls entry of new individuals into the fishing industry. Every fisherman is required to have a fisherman registration card.

D. Resettlement of excess fishermen into the other sectors

Buy back scheme

Continue- Management measures.....

E. Closed fishing areas

identification of nursery areas that should be protected and managed as a nursing area to ensure survival of juveniles of commercially important fish species – (i.e Refugia of Lobster in east Johor- under studies)

F. Management zones

Marine Park (i.e Pulau Redang & Pulau Perhentian)

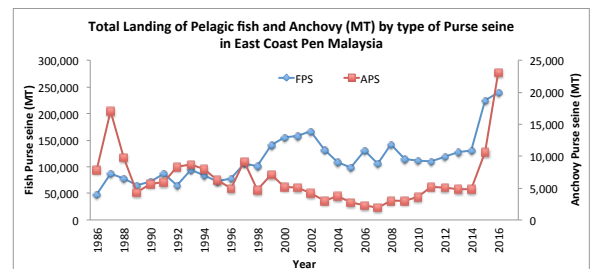
G. Rehabilitation of Resources

Artificial reef: to alleviate the problem of depleting fish resources in the coastal waters

H. Monitoring, Control and Surveillance Programme for fisheries management

Vessel Monitoring System (VMS) and Automatic Identification System (AIS)

Landing Trend



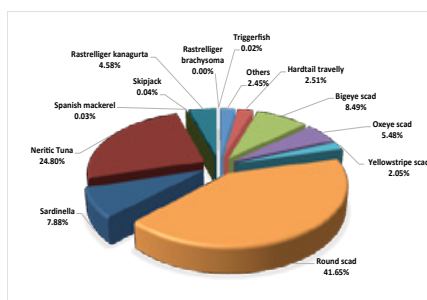
Total Landing from 1986 – 2016 by fish and anchovy purse seine in ECPM

Fish Composition by Fish Purse seine

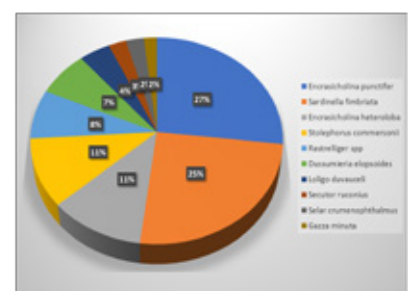
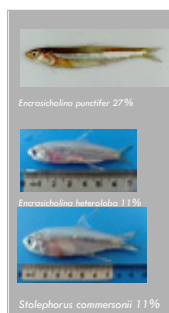
Average 2015 & 2016

Small Pelagic Fish

- D. maruadsi 25%
- D. macromoma 15.83%
- Bigeye scad 8.49%
- Sardinella 7.88%
- Neritic Tuna -24.8%
- Longtail tuna
- Kawakawa
- Frigate tuna



Fish Composition by Anchovy Purse seine



The Length at First Maturity by species

Base on study

Information Collection for Sustainable Pelagic Fisheries in the South China Sea 2006

Species	Total Length at first maturity (mm)	
	F	M
<i>R.kanagurta</i>	183 - 184	194 - 233
<i>Decapterus maruadsi</i>	146 - 155	166 - 175
<i>Decapterus macrosoma</i>	154 - 163	156 - 185

Spawning Season

Base on study

Information Collection for Sustainable Pelagic Fisheries in the South China Sea 2006

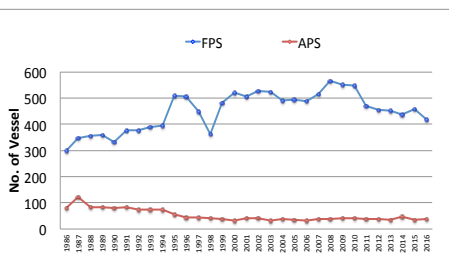
Species	Spawning Season
<i>R.kanagurta</i>	May-Jun & Jul-Sept
<i>Decapterus maruadsi</i>	Mar – May & Jul- Aug
<i>Decapterus macrosoma</i>	Mar – Apr & Jul - Aug

Fishing effort for purse seine fisheries

No of Fish and Anchovy Purse Seine in ECPM 1986-2016

FPS –Decrease since 2008 until present

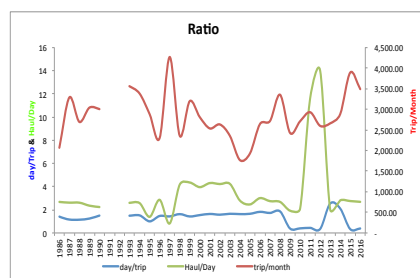
APS –Decrease since 2013 until present



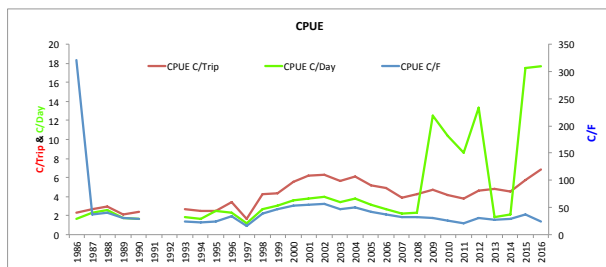
Fishing effort – Ratio

Data in 1991 & 92 are unreasonably to plot.-No of day, trip & haul to high

2011 & 2012- The no. of day to low compared other year



CPUE (Catch/Trip,Day &Fishing unit)



Data in 1991 & 92 are unreasonably to plot.-No of day, trip & haul to high

Status of pelagic fish stock

In ECPM, :

The total pelagic biomass is estimated about 405,332 MT.

The potential yield of pelagic fish is estimated about 202,466 MT,

Decapterus maruadsi and *Rastrelliger kanagurta* are the major pelagic fishes found in survey areas.

Thank You





**THE 3rd CORE EXPERT MEETING ON “COMPARATIVE
STUDIES FOR MANAGEMENT OF PURSE SEINE FISHERIES
IN THE SOUTHEAST ASIAN REGION”
(JAPANESE TRUST FUND VI)**



**Kuala Lumpur, Malaysia
12-14 September 2017**

***Country Presentation*
MALAYSIA**

Country Report on Purse Seine Fisheries in the West Coast Peninsular Malaysia

by

**Mr. Abdul Wahab Abdullah
Senior Research Officer
FRI Kg. Aceh, Perak, Malaysia**



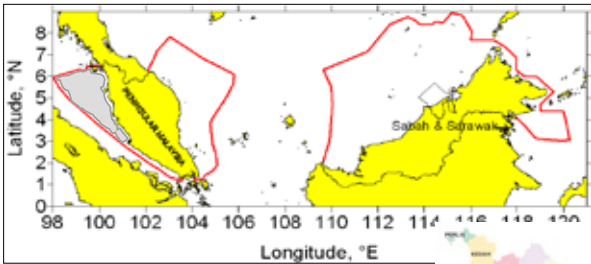
Country Report for The West Coast of Peninsular Malaysia (WCPM)



ABDUL WAHAB ABDULLAH & SALLEHUDIN JAMON
FRI KG ACHEH, DEPARTMENT OF FISHERIES MALAYSIA

INTRODUCTION

Overview of PS fisheries in WCPM



- The total sea area of WCPM which in The Straits of Malacca is about 30,665km²
- The PS fishing area for WCPM is limited
- Involved only 5 states out of 8 - Perlis, Kedah, Pulau Pinang, Perak & Selangor

Overview of PS fisheries in WCPM



- 2 types of PS – Fish and Anchovy PS
- Purse seines are the second most efficient fishing gear in contributing to the fish landings after trawlers.
- 21 % from total landing in WCPM contributed by PS fishery (DOFM statistics, 2016)
- Majority of FPS uses FADs. Only zone C, C2 and C3 are allowed to use support vessel
- All APS hunting schools of anchovies during daytime only

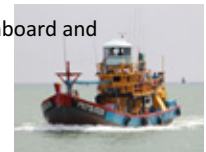
PS vessels in WCPM

- All purse seines vessels were categorized based on their gross tonnage (GRT(Gross Registered Tonnage)),
- For each tonnage, the vessel are allowed to operate within a specified fishing areas such as for the tonnage groups of
 - Below 39.9 GRT (8 - 15nm),
 - 40 – 70 GRT, (15 nm off shore) and
 - above 70 GRT (above 30 nm off shore).
 - Anchovy PS are allowed to operate within 1-8 nm (Zone A)



PS Fishing gear

- All PS use surrounding nets with purse line
- Nylon nets with mesh size between 7.8-100mm (SEAFDEC, 1989)
- Support equipment such as Radar, GPS, Sonar and echosounder and also deck machinery such as power block are mostly used.
- The use of light raft, fish shelter or “unjam” (FADs) and light boats has increased.
- Almost all APS has boiling facilities onboard and storage area for boiled anchovies.

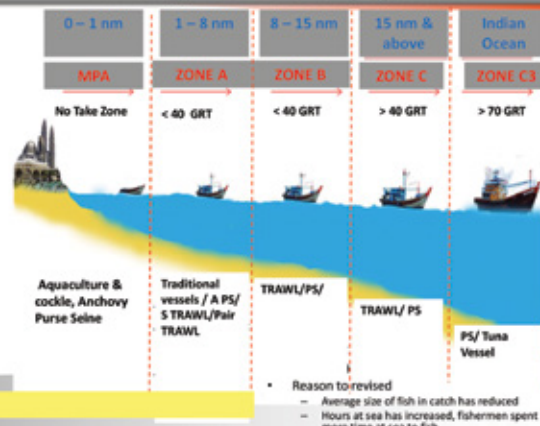


Regulations and licensing

- Operation zone C and C2 has been combined due to limited area of Straits of Malacca
- Compulsory use of AIS for B & C zone vessels* and VMS for C2 vessels *Source: DOFM (Pekeliling Bil 11/2014)
- PS license will be re-new based on yearly performance on these criteria:
 - Landing of fish ≥ 350 MT
 - MTU activation ≥ 80% of sea hours

Source: DOFM (Dasar/Pekeliling/SOP, 29 July 2013)

Revised Fishing Zone for WCPM (Perlis, Kedah, P.Pinang, Perak & Selangor), 2014

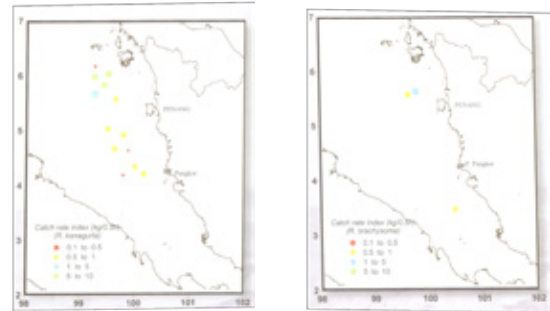


Main fishing area for FPS



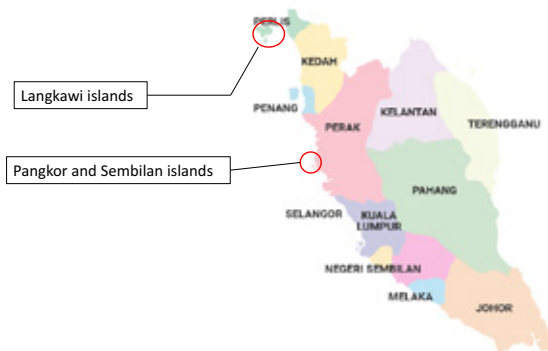
Source: BOBLME-SEAFCED/MFRDMD (2015)

Distribution of the 2 dominant pelagic species caught by PS



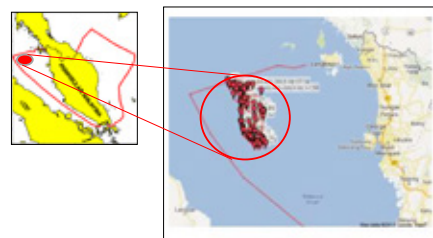
The catch distribution of *Rastrilliger kanagurta* and *Rastrilliger brachysoma* at the WCPM in 2006 (Abu Talib et al, (Eds) 2009)

Main fishing area for APS



Map source: malaysiavisa.org

The common fishing area of PS vessels of >70GRT in WCPM



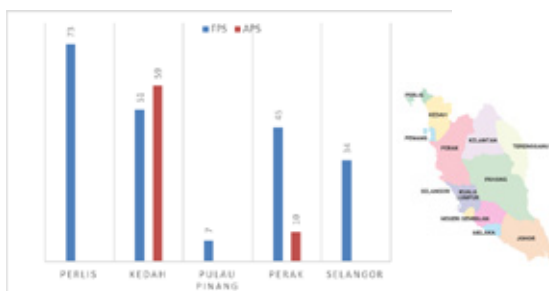
• Most FADs for the PS >70 GRT can be found at this area

FISH AGGREGATING DEVICES (FADs)

- The FADs normally was set in areas with depths **exceeding 40 meters**. The FADs are made of coconut leaf and anchored by several concrete sacks.
- Most of the FADs are maintained and some of the owners employed fishermen to look after their FADs to prevent stealing or encroached by other fishermen.
- Most areas with sufficient depth were located in the **northern most of Malacca Strait**. The larger purse seiners (>70 GRT) can only operate in areas beyond 30nm from the shore as stated under the Zoning Regulation by the Fisheries Authority.

Trend of landing, number of PS vessels and fishing efforts

Licensed PS vessels in 2016 by WCPM states



- Overall licensed PS vessels in WCPM (2016) 279 units– 210 Fish PS and 69 Anchovy PS

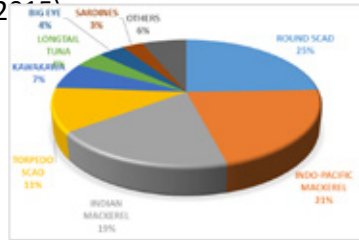
Landing of marine fish by PS group, 2016 (MT)



- Total marine fish landing contributed by PS in WCPM was 168,403 MT (21% from the overall landings (all gears) in WCPM).

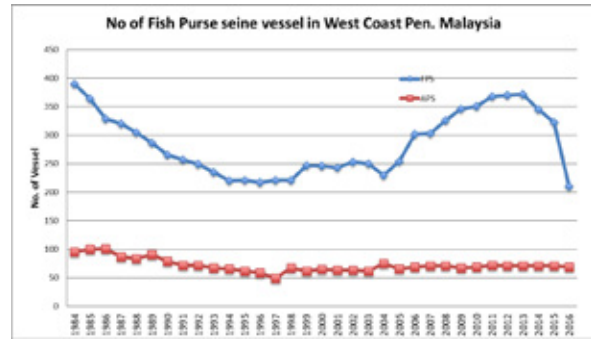
Catch composition of all PS in WCPM

- The major species were the mackerels, the scads, neritic tuna, anchovies and sardines (2000-2015)

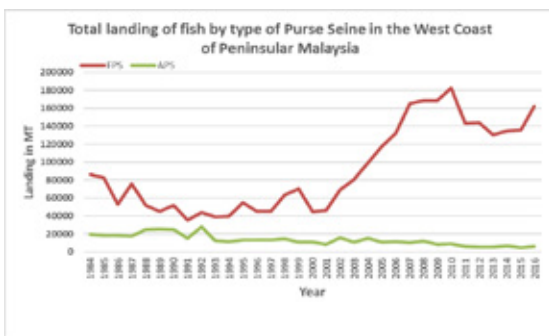


Species composition percentage in 2015

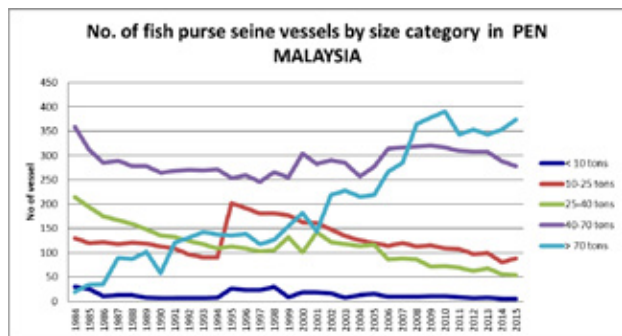
Trends on the number of PS



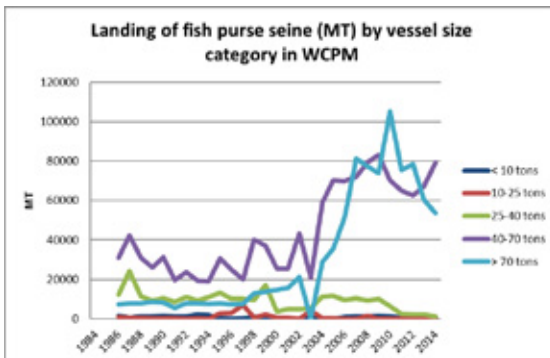
Landing trends of PS



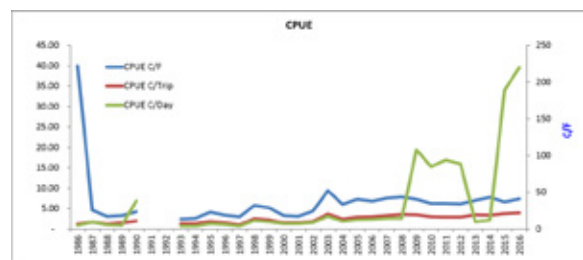
Trends on number of PS vessels



Nominal catch trend by size category



CPUE vs cumulative Fishing unit, Trip and Day



Trends in CPUE(MT/trip) (2000,2008, 2016) by PS and zones for the assessed fisheries in WCPM

West Coast				CPUE (MT/trip)		
Fishery area	Vessel size (GRT)	Fishing area (nm)	Days/trip	2000	2008	2016
Fish purse seines	< 40	B Zone: 5-12	1	1.43	2.07	1.06
	40-69.9	C Zone: 12-30	1	1.52	3.60	3.92
	> 70	C2 Zone: >30	3-4	7.77	9.70	17.03

Status of pelagic fish stock in the WCPM

Comparison of survey results on density of pelagic fish stock at WCPM

Year	Density (MT/km ²)	References
1998	9.6	National fisheries survey report, 2000
2006	7.5	Raja Bidin <i>et al</i> , 2009 in Abu Talib Ahmad <i>et al</i> (Eds) 2009.
2013	7.45	FRI (2016)

- The latest survey has the density of only 0.67% less than the survey in 2006, but 22.4% less than the 1998 survey.

Pelagic stock assessment surveys in WCPM (using acoustic survey)

Year	MT	
	Biomass	Potential Yield(MSY)
1998	311,000	155,500
2013	235,438	112,684
% reduced	24.3%	27.5%

- The total landing of pelagic fish in WCPM in 2013 was 130,213 MT, which exceed 16% of MSY.
- Steps has be taken to reduce the declining pelagic stocks

Spawning seasons: Indian mackerel *R.kanagurta*

Month	Area	Reference
October and April	WCPM	Pathansali (1967)
May and February	PM	Chee (1977)
Sept to February	WCPM	BOBLME-SEAFDEC/MFRDMD (2015) Malaysia report - unpublished

The occurrence of mature fishes throughout the year indicates that this species maturation is a continuous process

Length of 1st maturity (Lm)

<i>R.kanagurta</i>	Average size of maturity	Reference
Male/Female	18-19cm	Abu Talib <i>et al</i> (2009)
Male	22.8-23.2cm	BOBLME-SEAFDEC/MFRDMD (2015) Malaysia report - unpublished
Female	23.2-23.8cm	

Closed area in WCPM

- The existing protected area, under Fisheries Act 1985 are:
 - State of Kedah **Marine Park islands** – Payar Archipelago (48,058 ha of sea area), consist of 4 islands; Payar, Kaca, Lembu and Segantang. The islands were gazetted under Marine Parks Malaysia Order 1989
 - Fisheries Prohibited Area (FPA)** – Tanjung Tuan & Pulau Besar, Melaka. Pulau Besar and Tanjung Tuan Melaka was gazetted as FPA under the Fisheries (Prohibited Areas) Regulation (Amendment)(1988).



Peninsular Malaysia & the Payar Archipelago

Issues and challenges

- The demand to use light as fish aggregating device has increased not only in the PS fishery, even for other type of fishing apparatus.
- Latest pelagic stock assessment survey (2013) showed the pelagic stocks are depleting and are assumed in the status of over-exploitation. Although some of the pelagic species are highly fecund, the stock may be being overfished and more detail assessment is needed and should be done on regular basis.
- Sharing of information in the status of pelagic stocks in Andaman Sea & Straits of Malacca and cooperation between neighbouring countries are pivotal in order to manage properly the stocks.

Thank you



**THE 3rd CORE EXPERT MEETING ON “COMPARATIVE
STUDIES FOR MANAGEMENT OF PURSE SEINE FISHERIES
IN THE SOUTHEAST ASIAN REGION”
(JAPANESE TRUST FUND VI)**



**Kuala Lumpur, Malaysia
12-14 September 2017**

***Country Presentation*
MALAYSIA**

Country Report on Purse Seine Fisheries in Sarawak

by






**Mr. Jamil Musel
Senior Research Officer
FRI Bintawa, Sarawak, Malaysia**

*Prepared By
Jamil Musel*

COUNTRY REPORT ON PURSE SEINE FISHERIES IN SARAWAK

Fisheries Research Institute Bintulu Kuching Sarawak

OVERVIEW

-  The demand for fish in Malaysia is on an upward trend, and is expected to increase from 1.3 million metric tonnes in 2010 to 1.9 million metric tonnes in 2020.
-  The per capita consumption is predicted to increase from 46 kg to 55 kg over the same period.
-  The fishing industry has also contributed close to RM10.22 billion in 2015 and is envisaged to grow annually by 4.9% contributing close to RM 12.96 billion to the Malaysian economy by 2020.
-  The industry is an important source of food for the nation, the demand for fish-based protein outstrips the supply generated by the local industry.
-  To make up for the shortfall in demand, the country import fish and aquaculture from other countries in the region.

Fisheries Research Institute Bintulu Kuching Sarawak

OVERVIEW

Fish purse seine : **Commercial gears** in Sarawak

Demersal fishes: Largest part of marine catches
Pelagic fishes: Low catch - Low numbers of purse seiners operating in Sarawak (Witter *et al.*, 2015; Gambang *et al.*, 2003)

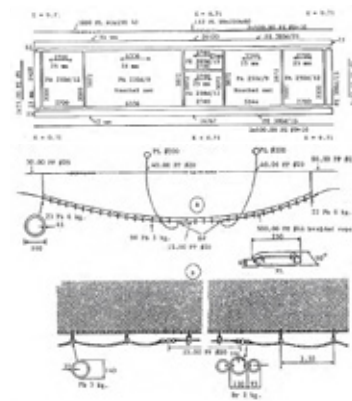
Fishing areas: Offshore areas and productive fishing grounds (southern bays and in the north)

Purse Seine Designed: Fine mesh & Coarser mesh
Vessel Size: 40 to 70 GRT **Gear Size:** 240 - 450m

Management measures for purse seine fishery:
 Licensing and Regulations are provided and managed by the Head of Fisheries, located in Kuala Lumpur

Fisheries Research Institute Bintulu Kuching Sarawak

INTRODUCTION DESIGN







INTRODUCTION RESEARCH AREA



Fisheries Research Institute Bintulu Kuching Sarawak

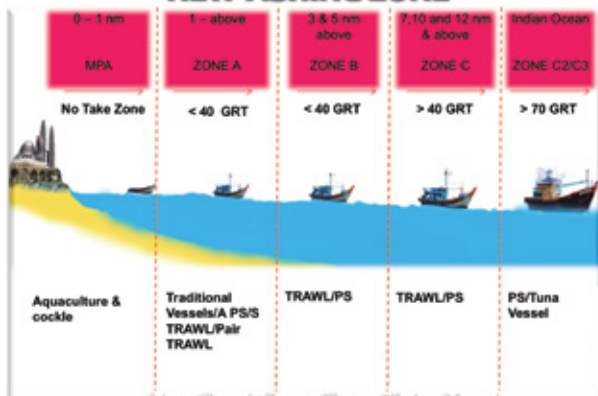
INTRODUCTION MANAGEMENT MEASURES

These measures were developed within the framework provided by the fisheries law, The Fisheries Act 1985 (Act 317). Among the main measures are--

-  Fishing Zones
-  Closed Fishing Area
-  Fishing Effort Control
-  Fishing Units Control
-  Port & At Sea Control
-  Fishermen Registration
-  Marine Habitat Conservation
-  The Community-based Fisheries Management

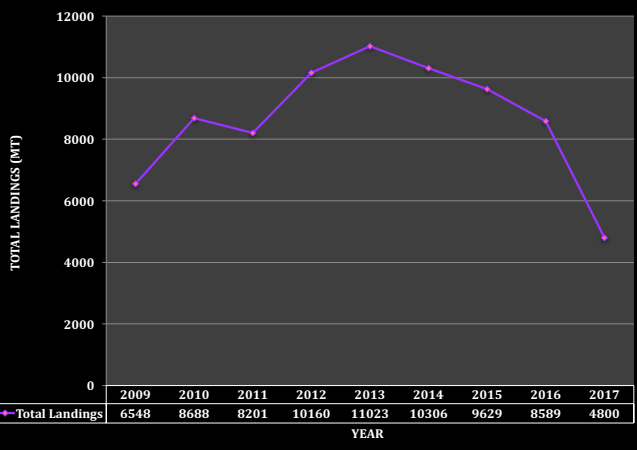
Fisheries Research Institute Bintulu Kuching Sarawak

INTRODUCTION NEW FISHING ZONE

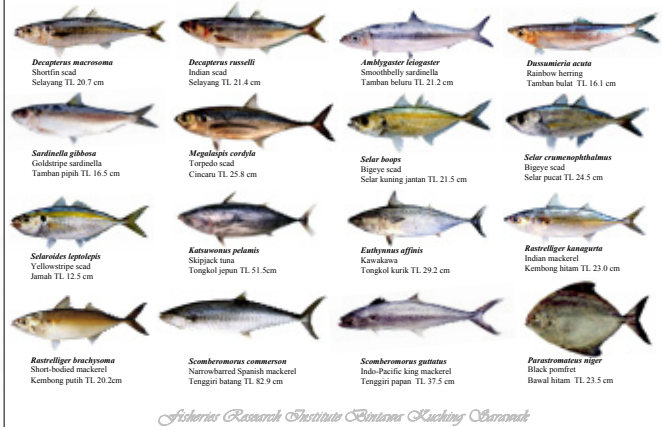


LANDINGS OF PURSE SEINE FISHERIES

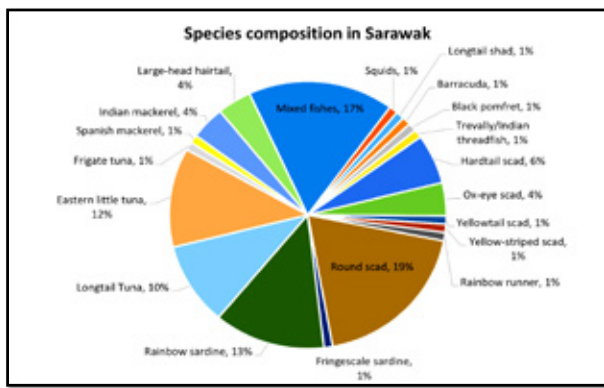
TOTAL LANDINGS OF PURSE SEINE IN SARAWAK [2009-2017]



Pelagic Fish of Sarawak



SPECIES COMPOSITION



Biological Information

*Note: Research by Mr Hadil Rajali (2006) & Mr Jamil Musel (2013)

Length at 1st Maturity

SPECIES	SEX	LENGTH [cm]
Decapterus maruadsi	Male	21.72
	Female	22.67
Decapterus macrosoma	Male	12.81
	Female	19.50
Decapterus russelli	Male	12.98
	Female	11.44
Rastrelliger brachysoma	Male	22.46
	Female	22.46
Rastrelliger kanagurta	Male	21.20
	Female	18.50

Biological Information

Spawning Season [2003-2005]

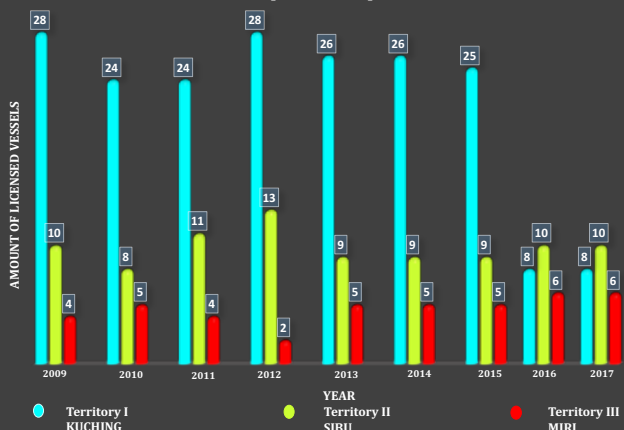
SPECIES	PERIOD
Decapterus maruadsi	May – June
Decapterus macrosoma	Sep – Oct
Rastrelliger kanagurta	July - Sep

Estimation of Growth & Mortality [2003-2005]

SPECIES	SITE	L _∞	K (year-1)	M	F	Z	Φ	E(F/Z)	Rn
R. kanagurta	2003	272.00	0.80	0.96	2.57	3.53	4.772	0.73	0.993
	2004	272.50	0.94	0.86	16.54	17.4	4.844	0.73	0.990
	2005	270.30	0.80	1.06	3.25	4.31	4.767	0.95	0.993
R. brachysoma	2003	259.00	0.90	0.95	3.13	4.07	4.774	0.77	0.978
	2004	261.00	0.70	0.80	6.41	7.2	4.678	0.89	0.999
	2005	260.00	0.90	0.94	4.21	5.15	4.784	0.82	0.999
D. maruadsi	2003	257.00	0.70	0.80	2.72	3.52	4.665	0.77	0.996
	2004	258.00	0.40	0.56	2.70	3.25	4.425	0.83	0.999
	2005	254.00	0.50	0.65	1.46	2.11	4.509	0.69	0.995

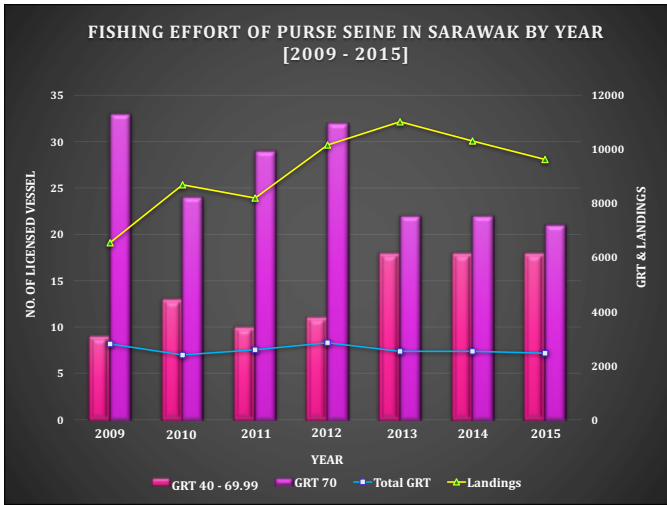
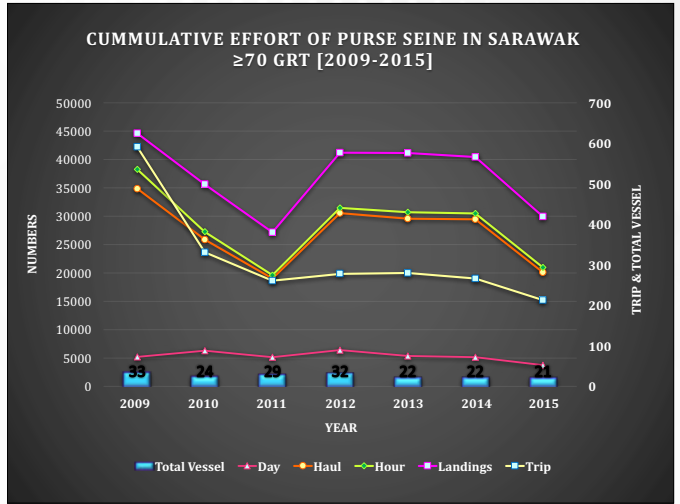
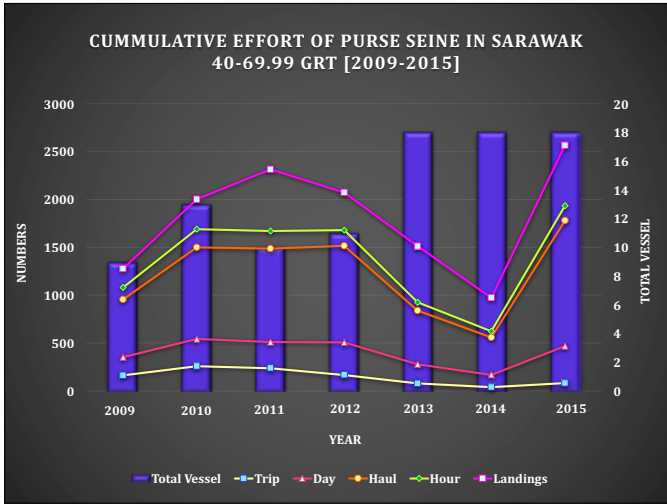
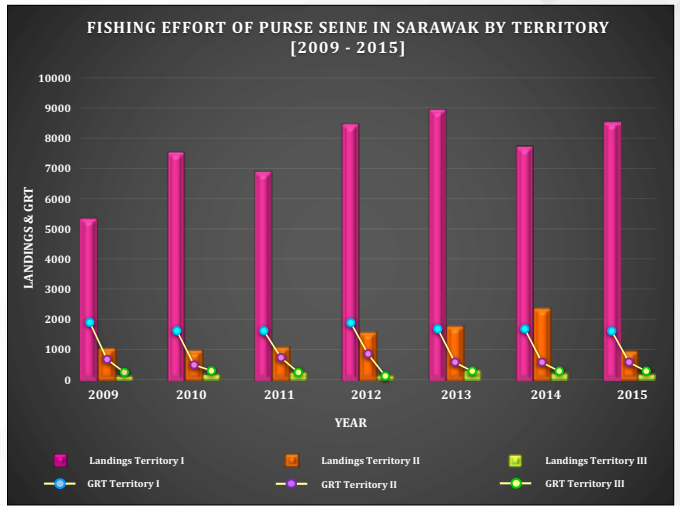
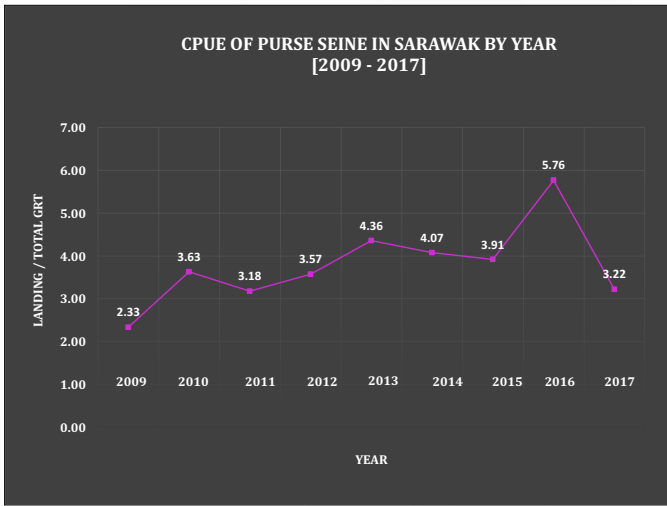
FISHING EFFORT FOR PURSE SEINE FISHERIES

NO. OF LICENSED VESSEL (PURSE SEINE) IN SARAWAK BY TERRITORY [2009 - 2017]



CUMMULATIVE EFFORT OF PURSE SEINE FISHERY IN SARAWAK [2009-2016]

YEAR	GRT	Total Vessel	Trip	Day	Haul	Landings
2009	40-69.99	9	162	192	601	197
	≥70	33	591	5,198	29,668	6,351
2010	40-69.99	13	259	285	955	312
	≥70	24	331	6,273	19,612	8,375
2011	40-69.99	10	239	273	975	645
	≥70	29	261	5,124	13,894	7,556
2012	40-69.99	11	168	341	1,008	393
	≥70	32	278	6,399	24,171	9,767
2013	40-69.99	18	79	201	561	585
	≥70	22	280	5,377	24,211	10,438
2014	40-69.99	18	40	128	392	350
	≥70	22	266	5,145	24,313	9,956
2015	40-69.99	18	84	385	1,311	631
	≥70	21	213	3,749	16,363	8,998
2016	40-69.111	8	139	897	2,455	8,589
	≥70	15	198	3,213	12,771	
		303	3588	43180	173261	73143





STATUS OF PELAGIC FISH STOCK

ITEMS	UNIT	2015
Area	km ²	150,627
Average Density (D)	tonnes/km ²	3.46
Total Biomass (Q)	MT	521,169
Current Yield (Y)	MT	46,777
Potential Yield (MSY)	MT	79,192
Surplus	MT	32,415

Fisheries Research Institute Bintulu Kuching Sarawak



 Joint venture program, close season and closed area management is not yet applied due to Sarawak have more than enough available resource

 According to our latest survey in 2015 (Fisheries Resource Survey in Malaysian Waters 2013-2016), the surplus is 32,415 MT.

Fisheries Research Institute Bintawa Kuching Sarawak





**THE 3rd CORE EXPERT MEETING ON “COMPARATIVE
STUDIES FOR MANAGEMENT OF PURSE SEINE FISHERIES
IN THE SOUTHEAST ASIAN REGION”
(JAPANESE TRUST FUND VI)**



**Kuala Lumpur, Malaysia
12-14 September 2017**

***Country Presentation*
MALAYSIA**

Country Report on Purse Seine Fisheries in Sabah

by

**Mr. Mohd Zamani Nayan
Fisheries Officer
Department of Fisheries Sabah, Malaysia**

THE CORE EXPERT MEETING
ON COMPARATIVE STUDIES FOR MANAGEMENT
OF PURSE SEINE FISHERIES IN THE SOUTHEAST
ASIAN REGION
12 – 14 SEPTEMBER, 2017

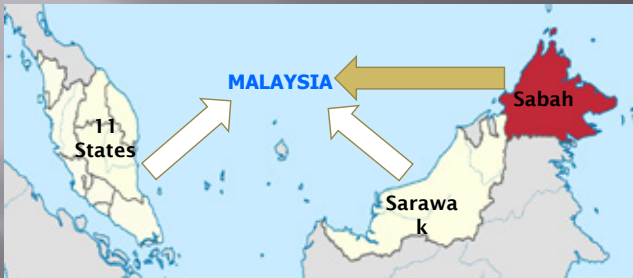
KUALA LUMPUR, MALAYSIA

Prepared By:
ZAMANI NAYAN
MARINE RESOURCE MANAGEMENT
DEPARTMENT OF FISHERIES SABAH

CONTENTS

- 1.0 INTRODUCTION
- 2.0 LANDING OF PURSE SEINE FISHERIES
- 3.0 FISHING EFFORT FOR PURSE SEINE FISHERIES
- 4.0 STATUS OF PELAGIC FISH STOCK
- 5.0 EXISTING MANAGEMENT STRATEGIES

1.0 INTRODUCTION



Surrounding by South China, Sulu & Celebes Sea



Sabah: 2nd largest state, longest coastline approximately 1,600km, territorial waters extend from 12 nautical mile to 200nm, EEZ cover around 55,805 sq km

SABAH FISHERIES ZONE



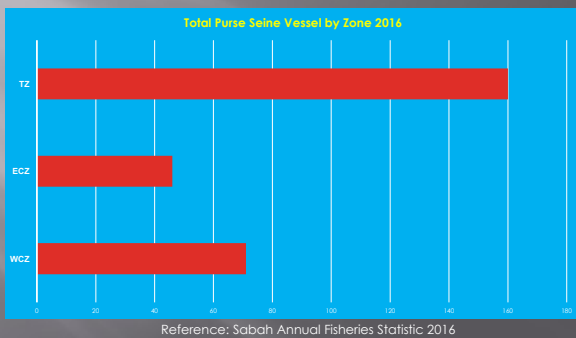
SABAH FISHERIES ZONE



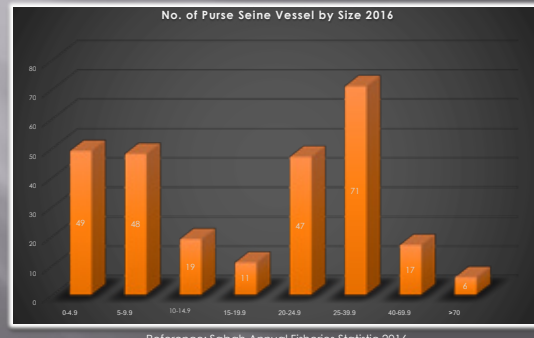
Purse Seine vessels in Sabah



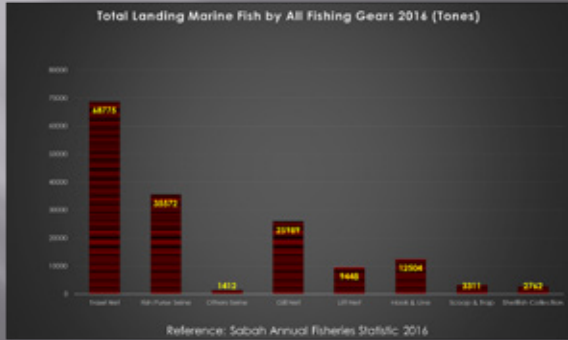
Purse Seine vessels in Sabah



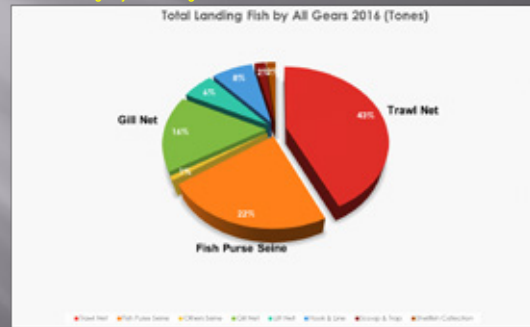
No. of Purse Seine Vessel by Size 2016



2.0 LANDING OF PURSE SEINE FISHERIES

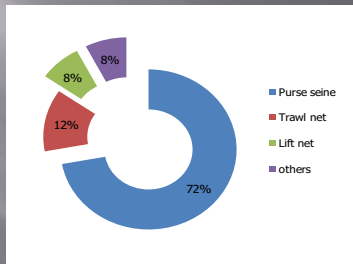


Total Marine Fish Landings by All Fishing Gears 2016



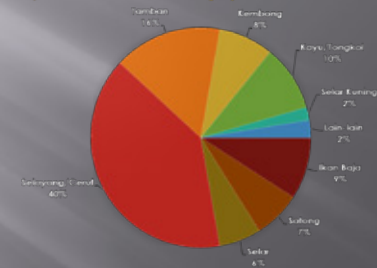
Percentage Of Mackerel Landing by Purse Seine Compare To Other Gears 2016

Purse seine contributed around 72 % of the total mackerel landing (*R. kanagurta* & *R. brachysoma*)



Reference: Sabah Annual Fisheries Statistic 2016

Composition Of Fish Landing by Purse Seine 2016

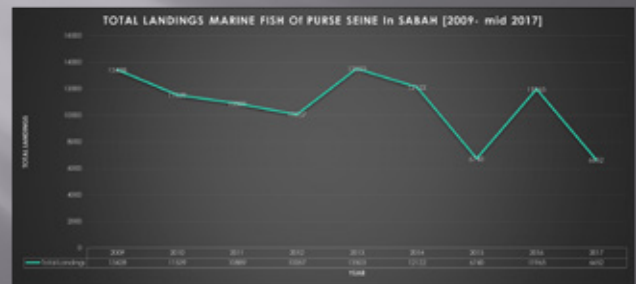


Reference: Sabah Annual Fisheries Statistic 2016

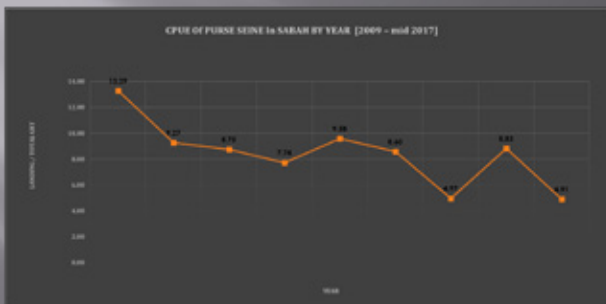
Fish Biological Information ?

- (a) Length of 1st Maturity
- (b) Spawning Season

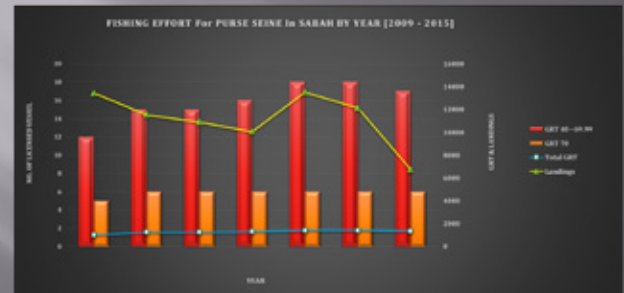
3.0 FISHING EFFORT FOR PURSE SEINE FISHERIES



Marine Fish landings by Purse Seine: 2009- mid 2017



FISHING EFFORT FOR PS IN SABAH BY YEAR 2009 - 2015



4.0 STATUS OF PELAGIC FISH STOCK

WE HAVE BEEN DONE WITH THE MALAYSIA MARINE FISH STOCK ASSESSMENT IN 2013-2015 BY ACOUSTIC METHODS

5.0 EXISTING MANAGEMENT STRATEGIES

Management Strategy :

- Control of Licensing
- Enforce Malaysia Fisheries Act 1985
- Establishment of MPA & Safety Zone

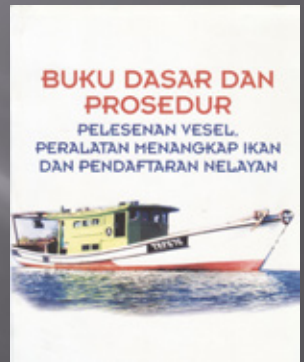
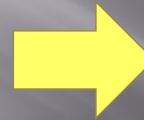
On going:

- Closed Season- need more discussion among purse seine operators and fisherman! Try to start ASAP!

CODED
COMPENDIUM
OF
FISHING
GEARS



MUDAH2A
N KITA
BOLEH
SEDIAKAN
YANG
TERBAIK
UNTUK
PANDUAN
KITA



Issue & challenge ?

- (1) LACK OF PERSONAL TO GET DATA OF LANDING
- (2) LACK OF EXPERT IN FISHING TECHNOLOGY





**THE 3rd CORE EXPERT MEETING ON “COMPARATIVE
STUDIES FOR MANAGEMENT OF PURSE SEINE FISHERIES
IN THE SOUTHEAST ASIAN REGION”
(JAPANESE TRUST FUND VI)**



**Kuala Lumpur, Malaysia
12-14 September 2017**

Country Presentation
MYANMAR

Purse Seine Fishery in Myanmar

by

Mr. S. Julius. Kyaw
Presenter
Department of Fisheries
Ministry of Agriculture Livestock and Irrigation, Myanmar

Purse Seine Fishery Myanmar

Department of Fisheries
Myanmar

• National Policy

- Food Security
- Food Safety
- Sustainable Rural Development

• Vision of Department of Fisheries

- Our vision is to ensure a sufficiency of fish supplies not only for the present entire national people but also for future generation by conserving of the fisheries resources with sustainable fisheries all time.



Marine fisheries water & environment

- Rakhine coastal region; (740 km; 36,780sq-km)
- Ayeyarwady delta zone; (105,138 sq-km)
- Taninthayi coastal region ; 1200 km mainland coast, 84,344 sq-km
- Myeik Archipelago; (800 islands- 34,340)



Coastal Fisheries activities

Coastal Fisheries activities are classified into two components as :-

- ❖ Marine Capture Fisheries
- ❖ Mariculture

Marine Capture fisheries

- ❖ Inshore Fisheries
- ❖ Offshore Fisheries

Mariculture

- ❖ Marine Fish, Soft-shell Crab and Shrimp
- ❖ Seaweed

Number of off-shore fishing vessels in Myanmar (2015-2016)

No	Type of Gear	Number
1	Trawl	1203
2	Purse seine	288
3	Stow net (Set Bag Net)	580
4	Drift net (Gill net)	318
5	Long line	34
6	Squid cast net	331
7	Fish Trap	124
Total		2878



Tanintharyi Region
Rakhine Region
Ayeyawaddy Region



Surveillance efforts on fishing activities

strict law enforcement on fishing activities (problem of illegal fishing)

- Enforcement agencies with particular activities are listed as:-

Inspection at sea
Myanmar Navy
Myanmar coastal Guard

Inspection authority at shore
Department of Fisheries
Myanmar port authority
Myanmar custom
Immigration Department
Department of Marine Administration
Myanmar Police Force

Management Measures

- Check in check out reporting system.
- LSA
- Fishing gear
- Crew list
- Fishing Licence
- vessel registration



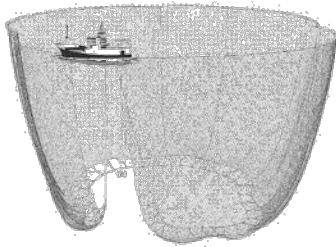
Fisheries Laws

Myanmar government enacts hereby the following laws to management fisheries :-

- Law relating to the Fishing Rights of Foreign Fishing Vessels (Law No.11/89) (2.4.8)
- Law relating to aquaculture(Law No.24/89) (7.9.89)
- Myanmar Marine Fisheries Law (Law No.9/90) (25.4.90)
- Freshwater Fisheries Law (Law No.1/91)(4.3.91)
- Law amending the Law relating to the Fishing Right of Foreign Fishing Vessels (Law No.15/93) (25.10.93)
- Law amending the Myanmar Marine Fisheries Law (Law No.16/93)(18.10.93)

Purse seine fishery

- The purse seine is a major fishing gear, used to exploit the pelagic fish resources. The two main types of purse seines fishing in Myanmar waters are the fish purse seine, which is used to catch pelagic species like Hilsa, and two boats seine, for anchovies in coastal waters, especially in the northern area of Rakhine state.



Fish purse seine

- The fish purse seine boats are about 50 to 100 GRT and operated in a traditional manner, without fish aggregating devices (FADs). Most purse seiners have a skipper with expertise in seeking out fish schools by sonar. Hilsa fish is mainly harvests and fishing season for fish purse seine is October to May.



Anchovy purse seines

- Anchovy purse seines boats are two boats seine operated in very shallow waters inshore areas and target mainly anchovies of the genus *Stolephorus*. Relative to the "fish lures light", and at night, free-school scouting purse nets using lights. The anchovy purse seine fishery mainly harvests small mackerels and sardine species, such as *Rastelliger* spp. and *Sardinella* spp. The fishery is important, particularly along the northern coast of Rakhine. Post-harvest techniques are primitive, relying on sun-drying on the shore. Fishing season is October to May.



Purse seine fishing boats

Number of purse seine fishing vessel engaged in offshore and inshore fishery water

No	Type of Gear	Year								
		2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016
1	Fish Purse Seine (Offshore)	152	158	161	168	273	278	287	283	284
2	Anchovy Purse Seine (Inshore)	375	374	375	377	366	362	360	297	217

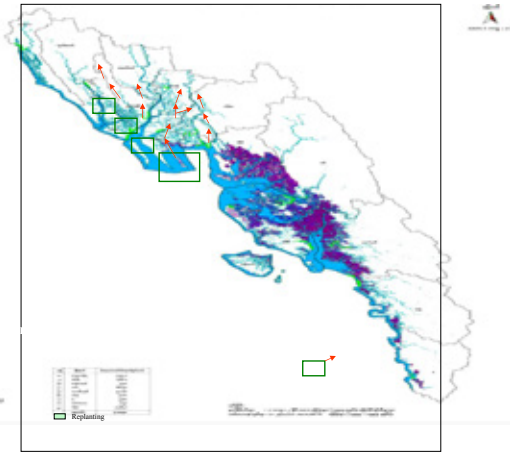
Pelagic Fishes

Hilsa shad



- Hilsa is very important pelagic fish resource, contribute to the national economy by small-scale fishery and industry fishery. It is distributed widely entire coast of Myanmar as well as in the inland waters. The fish take migration through the river system, particularly, Ayeyarwady river complex for spawning.
- Fishing season of the delta area is from September to March with two peak seasons namely, August and September. The most effective fishing gears in previous days is encircling gill nets. Since last decade, the new fishing technology, purse seine was introduced to this fisheries to make more catching power.





Offshore and Inshore Purse Seine Catching Activities and (CPUE)

- Offshore Fish Purse seine**
 Number of Haul / day = 1 – 2 haul / day
 Number of day / trip = 15 – 20 days
 Number of day / Month = 20 days
 Number of fishing month / year = 7 - 8 months
 CPUE = 1.5 to 2.0 ton / day
- Inshore Anchovy Purse seine (two boats seine)**
 Number of Haul / day = 1 – 2 haul / day
 Number of day / trip = 1 – 2 days
 Number of day / Month = 10 days
 Number of fishing month / year = 6 months
 CPUE = 1 - 1.5 ton / day (Average)

Pelagic Fishes Mackerels



Rastriliger kurnagurta
(Indian Mackerel)



Rastriliger brachysoma
Short Mackerel

The Indian mackerels are caught mainly by the fish purse seines, encircling gillnets and occasionally by bottom trawls. Their fishing grounds extend widely from the inshore to the offshore of Myanmar coastal areas.

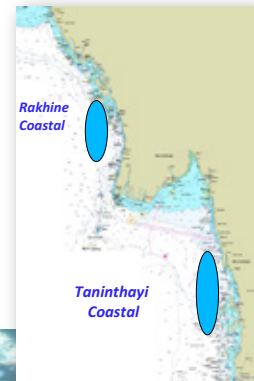
Indian Mackerel and Indo Pacific Mackerel Fishing Grounds



Rastriliger kurnagurta
(Indian Mackerel)



Rastriliger brachysoma
(Short Mackerel)



Fishing Season of the Indian Mackerel



Area	Months												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Rakhine													
Tanintharyi													

Fishing season



Pelagic Fishes

Sardines



The sardines found in Myanmar waters belong to *Sardinella spp.*; Among them the goldstriped sardine (*Sardinella gibbosa*), fringescale sardine (*Sardinella fimbriata*) and spotted sardine (*Sardinella Amblygaster*) are the most common. However, they are group together in the Myanmar fisheries statistics as sardines (*Sardinella spp.*).

Sardines are widely distributed with high concentration in the coastal areas. They are caught mainly by the purse seines, encircling gillnets and driftnets.

Pelagic Fishes Anchovies



The anchovies in the Myanmar waters belong to the species of *Stolephorus spp.*. The commerce's anchovy (*Stolephorus commerson*) and Indian anchovy (*Stolephorus indicus*) are commercially important and very abundant in the nearshore waters. The anchovies are exploited by small-meshed purse seines and beach seine.

Landing of Anchovy purse seine fisheries In Rakhine

Year	Number of boats	Catch (in ton)				Total (in ton)
		Anchovy	Sardine	Rastriliger spp	Other	
2005-2006	368	4505	1457	100	1030	7092
2006-2007	377	1978	1842	30	3857	7707
2007-2008	375	5024	1028	58	3022	9132
2008-2009	374	6188	2215	44	2170	10617
2009-2010	375	6973	3216	20	3998	14215
2010-2011	377	7873	3926	32	4301	16132
2011-2012	366	5031	1816	53	5812	12712
2012-2013	362	4205	2510	79	4098	10892
2013-2014	360	2156	4773	124	6899	13952

Pelagic Fishes

Round Scads



The round scad found in Myanmar waters are represented by three species of *Decapterus*. Among them *Decapterus macrosoma* and *Decapterus marudsi* are more common in Myanmar waters. The round scads are widely distributed in the offshore waters.

They are mainly caught by purse seines. The catches of all species of round scads are treated together as *Decapterus spp.* in the fisheries statistics

Pelagic Fishes

Bigeye scad



- The bigeye scads (*Selar crumenophthalmus*) are abundant and widely distributed in the offshore waters as the round scads.
- They are caught together with the round scads in purse seines and also in trawls.

Status of pelagic fish stock in 1979-1983

- With a view to identifying new fishing grounds and fish stocks using efficient means of exploitation, a "Marine Fisheries Resources Survey and Exploratory Fishing Project" was carried out with the assistance of FAO during 1979-1983. Project activities consisted of acoustic and experimental fishing surveys using the R.V. Dr. FRIDTJOF NANSAN, and trawl surveys using M.F.V 525 and others vessels from Myanmar.
- From the marine fisheries surveys undertaken, it was noted that a biomass of about 1.0 million tones of pelagic fish and 0.8 million tones of demersal fish existed in Myanmar marine fishery waters. Out of this total biomass, 0.5 million tones of pelagic fish and 0.5 million tones of demersal fish (totaling 1.05 million tones of marine fish) were estimated as the Maximum Sustainable Yield, MSY.

Anchovy purse seine in Rakhine state inshore area

Anchovy & Sardine Fishing data in inshore of Rakhine state

Content	Anchovy		Sardine	
	Purse seine	Drift gill net	Purse seine	Drift gill net
Number of Boat	320	350	40	400
Length of net(ft)	1000	800	1200	800
Engine power(HP)	25-28	25-28	25-28	25-28
Number of Fishermen	25	5	20-25	5
CPUE(Per year)	30tons	10tons	25tons	20tons

Catch species of Anchovy pursein



Classification

Phylum: Chordata
Class: Actinopterygii
Order: Clupeiformes
Family: Eugraulidae
Genus: *Stolephorus*
Species: *Stolephorus indicus*

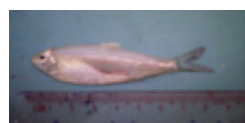
Common name Indian anchovy



Anchovy fisheries



Catch species of Anchovy pursein



Classification

Phylum: Chordata
Class: Actinopterygii
Order: Clupeiformes
Family: Eugraulidae
Genus: *Anchovilla*
Species: *commersoni*

Common name Commerson anchovy

Commerson Anchovy fisheries



Catch species of Anchovy pursein



Classification

Phylum: Chordata
 Class: Actinopterygii
 Order: Clupeiformes
 Family: Clupeidae
 Genus: *Amblygaster*
 Species: *A. sirm*

Common name **Spotted sardine**

Catch species of Anchovy pursein



Species *Sardinella* spp;



Sardine fisheries



Present status of pelagic fish stock in 2013

According to the 2013 survey result by research vessel Dr. Fridtjof Nansen in Myanmar water, pelagic fish stock was decrease shown as below;

Comparisons of pelagic fish biomass estimates
 1979-80 vs 2013

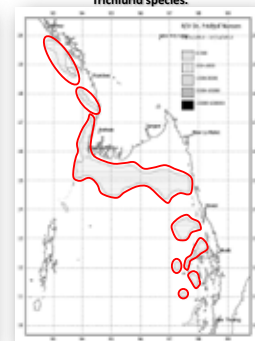
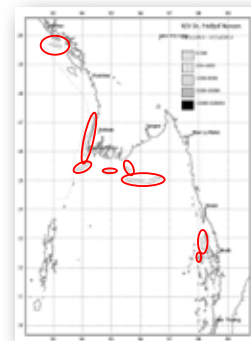
- 1979-80: **1,000,000 t** (10cm mean Length, apply)
- 2013 : **110,000 t** (10cm mean Length, apply)
- Standing stock in 2013 is possibly about 10% of 1980 Biomass

Present status of pelagic fish stock in 2013

Distribution of Pelagic Fish at Present

Pel 1- Clupeid and Engraulid species

Pel 2- Carangid, Scombrid, Sphyrnaid and Trichurid species.



At present pelagic fish stock was decreased already by over fishing.

Management Measure

Close areas and close season

Close Area

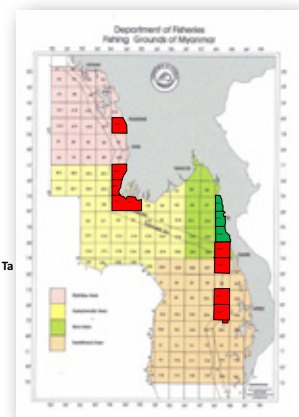
- To conserve the juveniles fish and shrimp, to avoid conflated between the artisanal fishermen and the trawler, the trawler will not allowed to fishing ten nautical miles from the shore line in all coastal areas.

Close Season

- May to July, these three months are closed season. That season most of the juveniles come back to the mangrove area (feeding ground). The fishing boats must stop fishing operation.

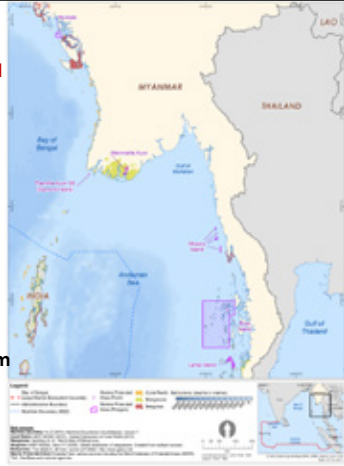
Prohibition of fishing Activities by DOF

- Spawning Season
 Jun- July-August (Started from 1993-94)
- Lobster and Commercial Fishes Spawning Season
 Jun- July-August (Started from 2008-09)
- Grouper (2/2006)
 All fishing ground, July-Aug-Sept
- Sea bass (2/2006)
 All fishing ground, Jan-Feb-Mar
- Hard Clam (9/2008) Myeik, Palaw, Kyae chaung and Ta Bo chaung point. 20 Acre
 Jan-Feb-Mar
- Set Bag net (Bom Kyaung Pike)- (1/2009)
 April- May
- Shark (2/2004) Myeik Archipelago



MPAs in Myanmar

- Protected area included national parks, shark protection areas, wildlife sanctuaries and mangrove reserves
- Protected biodiversity including coral reefs, mangroves, threatened species, and also to sustain the fisheries resources
- First official marine conservation efforts started in 1927
- Protected area spans 49.21 sq-km designated protect turtle species and water birds



Distribution of MPAs in Myanmar

List of MPAs in Myanmar

No	Site Name	Longitude	Latitude	National Designation	International Status	Establishment Year	Total Area (km ²)	IUCN Category	Habitat Types	Has Polygon
1	Lampi Island	98.21	10.86	Marine National Park	ASEAN Heritage Park	1996	234.94	Ib	Mangrove habitat, coral reef (warm)	✓
2	Meinmahla Kyun	95.30	15.97	Wildlife Sanctuary	ASEAN Heritage Park	1993	136.7	IV		✓
3	Moscos Island	97.92	13.86	Wildlife Sanctuary		1927	49.24	IV	Mangrove, coral reef and evergreen forest	✓
4	Ross Island	98.10	12.24	Shark Protected Area					Shark refugia site	✓
5	Thamehla Kyun GS (Diamond Island)	94.28	15.86	Wildlife Sanctuary		1970	0.88	IV	Protected turtle habitat	✓
6	Wundak	93.42	19.59	Reserved Forest		1931	229.2		Mangrove habitat	✓

- Among the list of MPAs, Lampi Island and Meinmahla Kyun which are ASEAN Heritage Parks
- In 1927, the government established the Moscos Wildlife Sanctuary in south eastern Myanmar in order to protect coastal flora and fauna

Constrain

- **Lack of up-to-date data:** information needed for marine fisheries is inadequate.
- Marine fisheries cannot be successfully managed unless information on key aspects is known.
- Accuracy of data collection: the difficulty in marine fisheries data collection is due to the dispersion of data sources. If data collecting is done through interviews and port or market sampling collectors may not get enough accurate data because data sources are numerous and disperse.
- Knowledge of scientific data collection: data collection is considered a science and gathering data has to follow scientific procedures. The lack of basic knowledge and standardization of data collecting protocols causes difficulties for stock identification for the specific marine species.
- Lack of financial support: scientific surveys of fish population in large ecosystem are a problem in Myanmar because of the limited budgets, equipment and qualified people. These constraints need to be resolved through internal arrangement.

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Conclusion

- In this regards, Myanmar has immediate to take a action for marine fisheries resources conservation.
- Develop methodologies and take measures for conservation and management, sustainable use and undertake studies on trans boundary fish stock .
- Encourage research and develop long-term monitoring programme, database and information sharing with international and regional conservation and management organizations such as FAO, SEAFDEC , BOBLME, etc. for technical and logistic support.
- Regarding data collection, training program for concerned institutions and stakeholders.
- More fund should be allocated for future research and data collection program are needed.
- Apart from the government's in fisheries development, collaboration and cooperation together with International and Regional fisheries related agencies is required.

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Thanks

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**THE 3rd CORE EXPERT MEETING ON “COMPARATIVE
STUDIES FOR MANAGEMENT OF PURSE SEINE FISHERIES
IN THE SOUTHEAST ASIAN REGION”
(JAPANESE TRUST FUND VI)**



**Kuala Lumpur, Malaysia
12-14 September 2017**

***Country Presentation*
PHILIPPINES**

Purse Seine Management in the Philippines

by

**Mr. Ronnie Romero
Ms. Grace D. V. Lopez
Presenter**

National Fisheries Research and Development Institute, Philippines

The Philippines: 3rd Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region

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Telefax. No. (02) 352-3596

OUTLINE

- ◆ INTRODUCTION
 - ◆ Overview of Philippine Capture Fisheries
 - ◆ Purse Seine Fisheries
 - ◆ Gear and Vessel Design
 - ◆ Fishing Area of Purse Seine in the Philippines
 - ◆ Management Measures for Purse Seine
- ◆ LANDING OF PURSE SEINE FISHERIES
 - ◆ Trend of landing
 - ◆ Information of species composition
 - ◆ Biological information
 - ◆ Length at first maturity
 - ◆ Spawning season

September 12-14, 2017 Kuala Lumpur, Malaysia

3rd Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region

2

OUTLINE

- ◆ FISHING EFFORT OF PURSE SEINE
 - ◆ Total Number of Purse Seine Vessels
 - ◆ No. of Days Per Trip
 - ◆ No. of Trips Per Month
 - ◆ No. of hauls per day
 - ◆ Trend of CPUE
- ◆ STATUS OF PELAGIC FISH STOCK
 - ◆ Biomass
 - ◆ MSY
- ◆ EXISTING MANAGEMENT STRATEGIES FOR PURSE SEINE
 - ◆ Close Season
 - ◆ Close Area
 - ◆ Joint venture program including chartered vessel arrangement

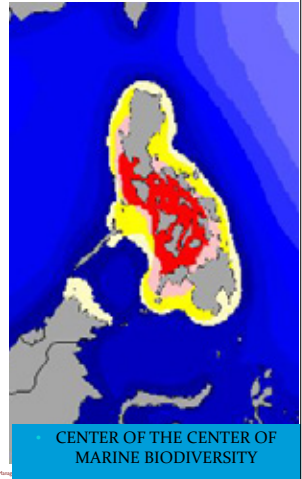
September 12-14, 2017 Kuala Lumpur, Malaysia

3rd Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region

3

I. INTRODUCTION

- Philippines archipelago of more than 7,100 islands (archipelago/archipelagic doctrine)
 - Archipelagic waters -220 million hectares, approximately 88% of Philippine territory
 - Coastal: 266,000 sq. km
 - Oceanic: 1,934,000 sq. km
 - Has centers of diversity and endemism and its biological richness described as "Galapagos times ten" (Heaney and Regalado, 1998)
 - 52, 177 DESCRIBED Species and still counting (many more species remain unknown to science)
 - One of 17 megadiversity countries, which together contain 70-80% of global biodiversity (Mittermeier et al, 1997)



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PHILIPPINE CAPTURE FISHERIES: AN OVERVIEW

Municipal Fishing = refers to fishing within municipal waters using fishing vessels of three (3) gross tons or less, or fishing not requiring the use of fishing vessels.



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Number of off-shore fishing vessels in Myanmar (2015-2016)

No	Type of Gear	Number
1	Trawl	1203
2	Purse seine	288
3	Stow net (Set Bag Net)	580
4	Drift net (Gill net)	318
5	Long line	34
6	Squid cast net	331
7	Fish Trap	124
	Total	2878



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5

Tanintharyi Region Rakine Region Ayeyawaddy Region

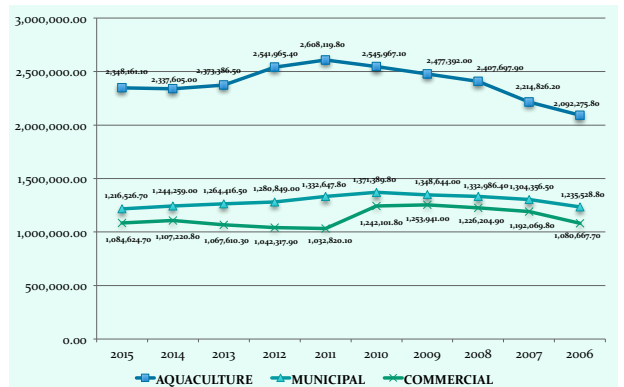


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6

FISHERIES PRODUCTION (CY 2006-2015)



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Purse Seine Fisheries: Types

I. Small Pelagic

a. Sardine/ Scad Purse Seine:

Net: 540- 720 m long; 108- 144 m depth
MS: 20-33.8 mm
Boat: 30- 150 GT

b. Mackerel Purse Seine

Net: 720-900 m long; 126- 144 m depth
MS: 20-33.8 mm
Boat: 30- 150 GT

II. Tuna Purse Seine

a. Hybrid:

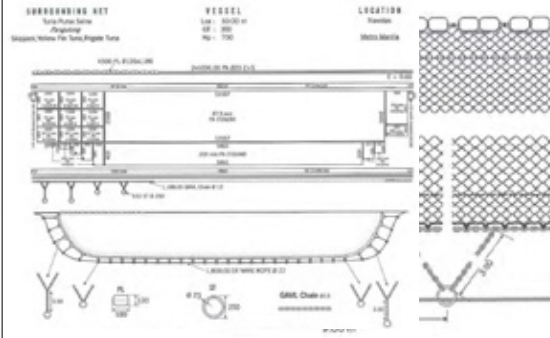
Net: 720- 1080 m long; 144-250 m depth
MS: Bunt: 88.9- 127 mm; Body and Wing: 76.2-254 mm
Boat: 200-300 GT

b. Super Seine

Net: 1080-2,160 m long; 2-16-234 m depth
MS: Bunt: 88.9- 127 mm; Body and Wing: 76.2-254 mm
Boat: 400 GT - above

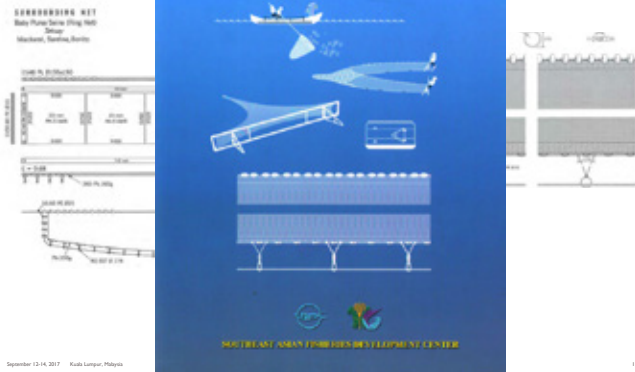
Purse Seine Fisheries:

Gear Design



Hybrid

FISHING GEAR AND METHODS IN SOUTHEAST ASIA: III. PHILIPPINES PART I



Purse Seine Fisheries:

Fishing Vessels (Catcher)



Purse Seine Fisheries: Fishing Vessels (Carrier)



Purse Seine Fisheries:

Fishing Vessels (Light Boat)



Major Purse Seine Fishing Grounds



National Fisheries Management Legislation



- Republic Act (RA) 8550 "The Philippine Fisheries Code of 1998) as amended by RA 10654 "An Act to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing"

LEGISLATIONS RELATED TO FISHERIES MANAGEMENT

- ❖ The Wildlife Conservation and Protection Act of 2001 (RA 9147)
- ❖ Agriculture and Fisheries Modernization Act (AFMA) (RA8435)
- ❖ Local Government Code (LGC) (RA 7160)
- ❖ ARMM Organic Act (RA6734).



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Management Measures in Relation to Purse Seine Fisheries

- National Tuna Management Plan
- National Plan of Action to Deter Illegal, Unreported and Unregulated Fishing (NPOA-IUUF)
- National Tuna Fish Aggregating Device (FAD) Management Policy
- Demarcation of Fishery Management Areas (FMA)
- Sardine Management Plans
- Roundscad Management Plan
- Management of Long Distance Fishing
- Establishment of RPs for HCR
- Implementation of eCDTS
- BoatR and FishR

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Other Initiatives

- I. Port Sampling
- II. Logsheets
- III. Philippine Fisheries Observer Program
- IV. Vessel Monitoring System/ VMM
- V. Catch Certification

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National Fishing Regulations

FAO 144, s 1993	Rules and regulations on commercial fishing
FAO 188, s 1993	Regulations governing the operating of commercial fishing boats in Philippine Waters using tuna purse seine nets
FAO 198, s 2000	Rules and regulations on commercial fishing
FAO 199, s 2000	Guidelines on fish transshipment
FAO 223, s 2003	Moratorium on the issuance of new Commercial Fishing Vessel and Gear License (CFVGL) as part of precautionary approach to fisheries management
FAO 223-1, s 2003	Amending Sec. 1 and 2 of FAO No. 223, s. 2003, re: Moratorium on the issuance of new Commercial Fishing Vessel and Gear License (CFVGL) as part of precautionary approach to fisheries management
FAO 226, s 2008	Regulations on the Mesh Size of Tuna Purse Seine Nets and Trading of Small Tuna

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National Fishing Regulations

FAO 236, s 2009	Rules and regulations on the Operation of Purse Seine and Ring Net Vessels Using FADs locally known as Payaos during the FAD Closure Period as Compatible Measures to WCPFC CMM 2008-01
FAO 238, s 2012	Rules and Regulations Governing the Implementation of Council Regulation (EC) No. 1005/2008 on the Catch Certification Scheme
FAO 240, s 2012	Rules and Regulations in the Implementation of Fisheries Observers Program in the High Seas
FAO 241, s 2012	Regulations and Implementation of the Vessel Monitoring System (VMS) in the High Seas
FAO 244 s.2012	National Tuna Fish Aggregating Device (FAD) Management Policy
FAO 245 s.2012	Regulations and Implementing Guidelines on Group Tuna Purse Seine Operations in High Seas Pocket Number 1 as a Special Management Area

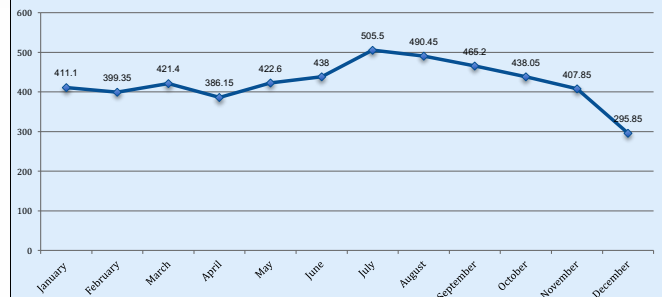
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II. Landing of Purse Seine (NSAP Philippines)

Average Monthly Purse Seine Landed Boats



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Average Landed Purse Seine Boats Per Year

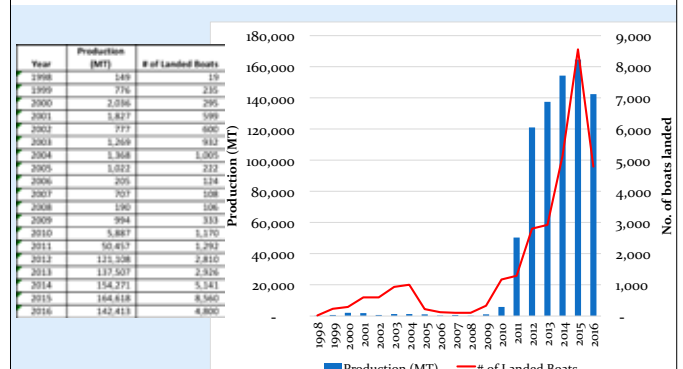


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Annual Trend of Landed Boats and Catch



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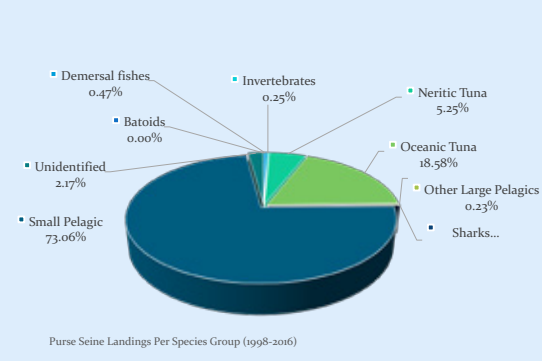
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Purse Seine Landings Per Year Per Species Group

Year	Batoids	Demersal fishes	Bivalves	Cuttlefishes	Octopus	Squids	Crabs	Lobsters	Mantis Shrimps	Shrimps and Prawns	Merlot Tuna	Oceanic Tuna	Other Large Pelagics	Sharks	Small Pelagic	Unidentified	Grand Total
1998	-	-	-	-	-	-	-	-	-	-	129,011.84	2,536.98	-	503.75	16,233.59	-	148,886.17
1999	-	1,131.82	-	-	-	14,631.83	-	-	-	-	947.17	95,988.44	-	-	615,630.78	48,552.84	776,482.89
2000	-	-	-	-	-	-	-	-	-	-	3,548.47	461,925.33	-	-	1,955,492.29	214,857.69	2,055,810.63
2001	-	975.77	-	-	23.03	-	-	-	-	-	53,123.65	279,103.88	1,335.55	-	1,413,621.32	78,477.19	1,826,669.40
2002	-	1,300.75	-	-	-	-	-	-	-	-	59,507.15	218,393.00	1,391.44	85.50	495,545.80	456.67	776,686.31
2003	139.50	14,070.78	-	1.78	-	7,231.38	-	-	-	-	39,125.11	195,021.65	5,635.30	-	966,335.09	41,008.18	1,288,538.17
2004	7.99	11,630.29	63.33	-	-	101.31	-	-	-	-	109,803.31	189,082.40	2,839.49	256.77	1,045,877.21	8,796.82	1,350,468.93
2005	-	4,067.79	-	-	-	188.55	-	-	-	-	17,477.92	11,977.37	1,444.60	-	929,313.13	3,538.96	1,027,004.24
2006	-	2,617.24	-	-	-	212.71	-	-	-	-	30,058.31	2,765.45	-	-	136,077.89	39.31	205,234.71
2007	-	18,471.48	-	-	-	152.91	-	-	-	-	51,373.38	523.77	-	-	695,783.52	278.14	765,944.61
2008	-	6,054.25	-	-	-	536.67	-	-	-	-	3,108.75	2,461.48	-	-	176,077.89	369.25	190,489.80
2009	-	4,590.00	-	-	-	791.25	-	-	-	-	45,941.67	95,343.76	711.00	-	496,206.93	5,466.90	593,851.50
2010	2.21	102,171.01	-	-	-	4,632.21	-	-	-	-	90,594.51	80,447.64	663.23	-	5,177,889.58	481,122.92	5,887,342.30
2011	-	427,396.93	-	-	-	21,431.10	-	-	-	-	408,314.91	25,108,300.55	88,998.21	830.18	21,387,859.83	2,785,546.16	50,572,557.77
2012	28.29	511,611.59	295.85	21.70	-	395,946.37	-	3,046.99	265.35	-	1,482,770.58	2,552,519.18	30,536.40	508.48	114,438,115.59	1,811,090.15	121,107,941.64
2013	38.76	407,238.55	-	-	-	536,276.71	872.78	-	214.93	-	1,157,423.33	2,874,303.84	16,964.79	130.00	136,387,889.30	2,235,571.93	137,585,504.93
2014	7.20	651,847.85	2,819.52	655.33	-	507,330.43	3,338.88	17.36	1,286.44	-	4,395,680.39	19,887,345.63	478,194.06	756.99	129,387,883.74	3,744,855.05	154,271,359.96
2015	7.28	788,726.85	13,500.00	81.81	19.86	307,343.67	1,112.30	4.59	57.14	-	7,618,542.40	11,353,272.03	989,552.27	170.26	138,797,884.95	5,280,929.23	164,017,079.94
2016	238.40	610,430.26	-	-	-	194,648.65	-	0.62	13.54	-	25,616,344.12	82,830,572.21	202,721.12	-	32,807,287.22	371,298.69	142,413,077.85
Grand Total	9,388.02	3,691,433.62	16,670.00	760.82	19.86	1,821,255.79	5,226.65	2,257	3,046.99	1,847.41	41,348,514.91	146,327,514.17	1,820,974.48	2,681.94	675,389,386.45	17,082,288.09	787,581,083.74

Overall Purse Seine Landings Per Species Group



Top Ten Species Caught (1998-2009)

Rank	Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
1	Small pelagic	148,886.17	776,482.89	2,055,810.63	1,826,669.40	776,686.31	1,288,538.17	50,572,557.77	58,873,421.37	121,107,941.64	137,585,504.93	154,271,359.96	142,413,077.85
2	Sardine	-	-	-	-	-	-	-	-	-	-	-	-
3	Merlot Tuna	-	-	-	-	-	-	-	-	-	-	-	-
4	Other Large Pelagics	-	-	-	-	-	-	-	-	-	-	-	-
5	Sharks	-	-	-	-	-	-	-	-	-	-	-	-
6	Unidentified	-	-	-	-	-	-	-	-	-	-	-	-
7	Batoids	-	-	-	-	-	-	-	-	-	-	-	-
8	Demersal fishes	-	-	-	-	-	-	-	-	-	-	-	-
9	Invertebrates	-	-	-	-	-	-	-	-	-	-	-	-
10	Crabs	-	-	-	-	-	-	-	-	-	-	-	-

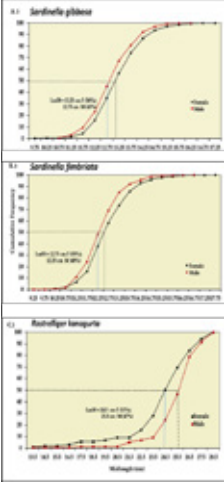
Top Ten Species Caught (2010-2016)

Rank	Species	2010	2011	2012	2013	2014	2015	2016
1	Sardine	102,171.01	511,611.59	5,887,342.30	121,107,941.64	137,585,504.93	154,271,359.96	142,413,077.85
2	Small pelagic	427,396.93	5,177,889.58	50,572,557.77	58,873,421.37	121,107,941.64	137,585,504.93	154,271,359.96
3	Merlot Tuna	90,594.51	80,447.64	30,536.40	508.48	114,438,115.59	1,811,090.15	121,107,941.64
4	Other Large Pelagics	408,314.91	25,108,300.55	88,998.21	830.18	21,387,859.83	2,785,546.16	50,572,557.77
5	Sharks	90,594.51	80,447.64	30,536.40	508.48	114,438,115.59	1,811,090.15	121,107,941.64
6	Unidentified	427,396.93	5,177,889.58	50,572,557.77	58,873,421.37	121,107,941.64	137,585,504.93	154,271,359.96
7	Batoids	90,594.51	80,447.64	30,536.40	508.48	114,438,115.59	1,811,090.15	121,107,941.64
8	Demersal fishes	90,594.51	80,447.64	30,536.40	508.48	114,438,115.59	1,811,090.15	121,107,941.64
9	Invertebrates	90,594.51	80,447.64	30,536.40	508.48	114,438,115.59	1,811,090.15	121,107,941.64
10	Crabs	90,594.51	80,447.64	30,536.40	508.48	114,438,115.59	1,811,090.15	121,107,941.64

Biological Information

Length at First Maturity

Species	Lm(50)	
	Female	Male
<i>Sardinella gibbosa</i>	13.25 cm	12.75 cm
<i>Sardinella fimbriata</i>	12.75 cm	12.25 cm
<i>Rastrelliger kanagurta</i>	24.5 cm	25.5 cm



Cumulative Frequency of Length at First Maturity (Lm50) of Female and Male Dominant Species in Manila Bay (2014-2015).

Biological Information

Spawning Season: Manila Bay

Species	Major Spawning	Minor Spawning	Fishing Ground	Reference
<i>Sardinella gibbosa</i>	March - April	October - December	Manila Bay	Manila Bay Study (2014-2015)
<i>Sardinella fimbriata</i>	February - May	October - December	Manila Bay	Manila Bay Study (2014-2015)
<i>Rastrelliger kanagurta</i>	October - December	May - June	Manila Bay	Manila Bay Study (2014-2015)

Biological Information Spawning Season of Major Fishes in Samar Sea

Species	J	F	M	A	M	J	J	A	S	O	N	D
Agumaa (<i>Rastrelliger laevis</i>)					1	1						
Galunggong (<i>Decapтерus spp.</i>)					2	2						1
Hairtail					2	2						
Hasa-hasa (<i>Rastrelliger brachysoma</i>)					2	2						
Alumahan, Barao (<i>Rastrelliger kanagurta</i>)					2	2	2					
Matambaka (<i>Selar crumenophthalmus</i>)								2				

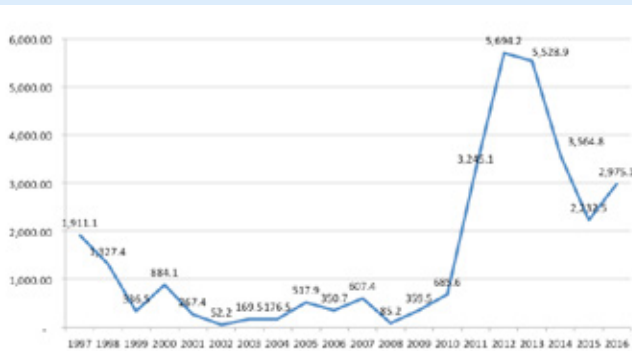
III. Fishing Effort of Purse Seine

(Fishing Regulations and Licensing Division- BFAR Philippines)

Philippine Flagged Purse Seiner Commercial Fishing Vessels		
Commercial Fishing Vessel and Gear License (CFVGL)	Tuna Purse Seine	Sardines/ Mackerel/ Scad Purse Seine
Small-Scale (3-20 GT)	1	13
Medium-Scale (20.1-150 GT)	68	244
Large-Scale (above 150)	95	60
Total	164	317

Annual CPUE of Purse Seine (Boat/Day)

(NSAP Philippines)

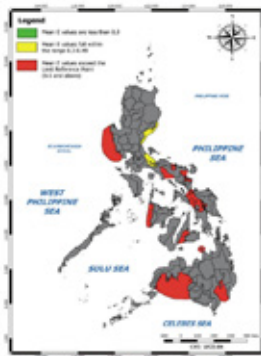


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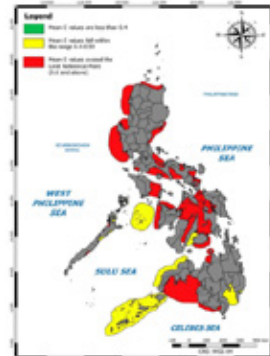
21

IV. Pelagic Stock Status (NSAP 2015)



Status of Philippine **neritic tunas** by fishing ground based on Exploitation (E) values using NSAP length-frequency data, 2015.

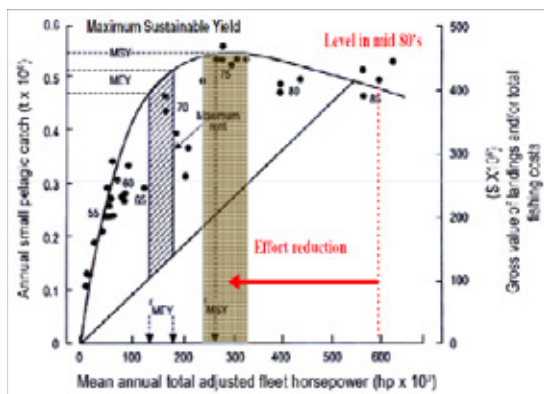
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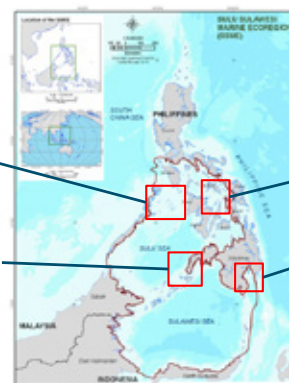
Status of Philippine **small pelagic fishes** by fishing ground based on Exploitation (E) values using NSAP length-frequency data, 2015.

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IV. MSY for Pelagic Species (Dalzell, et.al. 1996)



V. Existing Management Strategies for Purse Seine Close Season and Closed Area



- 4. Northern Palawan (2015) (Nov 31 to Jan 31)
- 2. Zamboanga Peninsula (2011) (Dec 1 to Mar 1)

- 1. Visayan Sea (1989) (Nov 15 to Feb 15)
- 3. Davao Gulf (2014) (Jun 1 to Aug 31)

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**THE 3rd CORE EXPERT MEETING ON “COMPARATIVE
STUDIES FOR MANAGEMENT OF PURSE SEINE FISHERIES
IN THE SOUTHEAST ASIAN REGION”
(JAPANESE TRUST FUND VI)**



**Kuala Lumpur, Malaysia
12-14 September 2017**

Country Presentation
THAILAND

Purse Seine Fisheries in Thailand

by

Dr. Watcharapong Chumchuen
Presenter
Fishing Technnology Development Unit,
Department of Fisheries, Thailand

Country Report on Purse Seine Fisheries in Thailand

Watcharapong CHUMCHUEN

Fishing Technology Development Unit
Department of Fisheries, THAILAND

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Outline

1. Introduction
2. Landing of purse seine fisheries
3. Fishing effort for purse seine fisheries
4. Status on pelagic fish stock
5. Existing management strategies

2

1. Introduction

3



Thailand

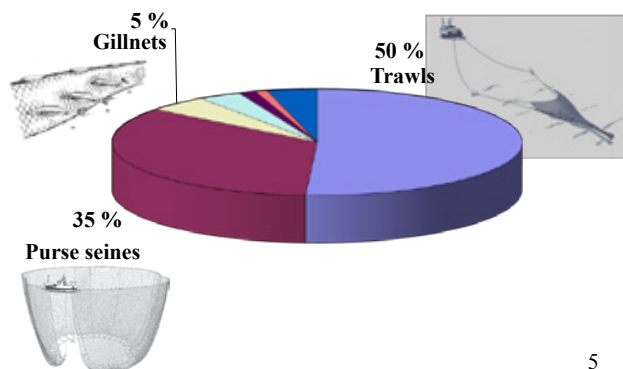
- 23 coastal provinces
- Coastline: 2,614 km along Gulf of Thailand (GOT) and Andaman Sea (ANS)

Marine capture fisheries in Thailand

- Landing 1.5 million t of catch
- Involving with 0.68 million people

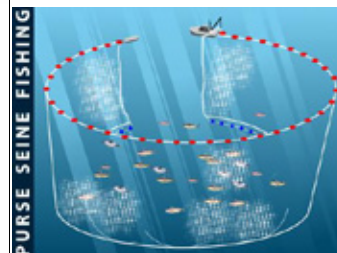
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Capture production of Thailand by fishing gear



5

Purse seine fishing in Thailand



- Thai purse seine
- Anchovy purse seine

6

Thai purse seine (Uan dum = Black seine)



Fishing boat
< 5 to > 60 GT



- Net: PA with black colour
- Length of float-line: 400-1,800 m
- Net depth: 60-110 m
- Mesh size: ≥ 25 mm

7

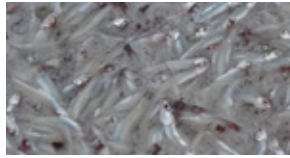
- Catches: Indo-Pacific mackerel, Indian mackerel, sardine, scads, bonitos, black pomfret and ponyfish
- Fishing techniques can be divided into 3 operation types
 - Free school (FS)
 - Light luring (LL)
 - Fish aggregating device FAD

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Anchovy purse seine



Fishing boat
< 5 to > 60 GT



- Net: PA (knotless) with green or brown colour
- Length of float-line: 250-450 m
- Net depth: 15-80 m
- Mesh size: ≥ 6 mm

- Catches: anchovies
- 2 types of anchovy purse seiners
 - Fishing boat without boiler
 - Fishing boat with boiler



Fishing areas

- Main fishing grounds are located in GOT and ANS
- Depth of fishing grounds for both Thai and anchovy purse seines is < 100 m

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Management measures

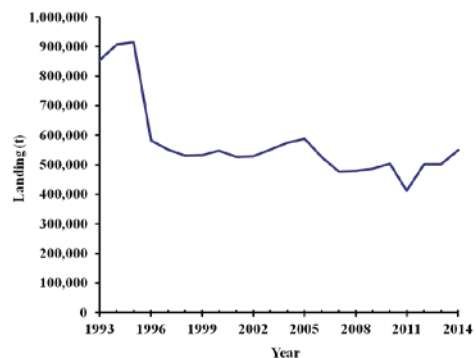
- Fishery acts of Thailand were revised in 2015
- Regulations for marine capture were updated
- For purse seine, the regulations are enforced to control the fishing power (gear and effort)
- Boat owners must renew their fishing license every 2 years

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2. Landing of purse seine fisheries

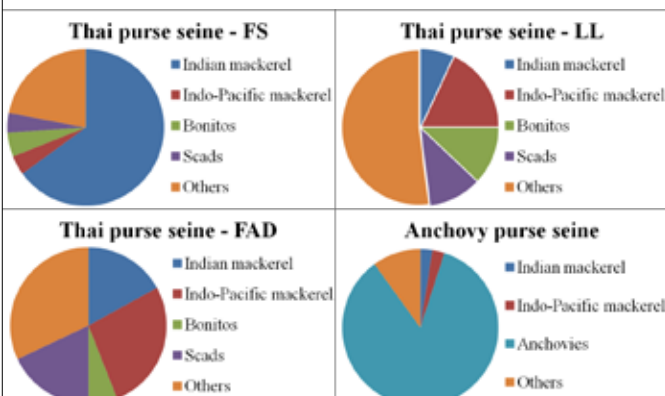
13

Total landing by purse seine



14

Species composition



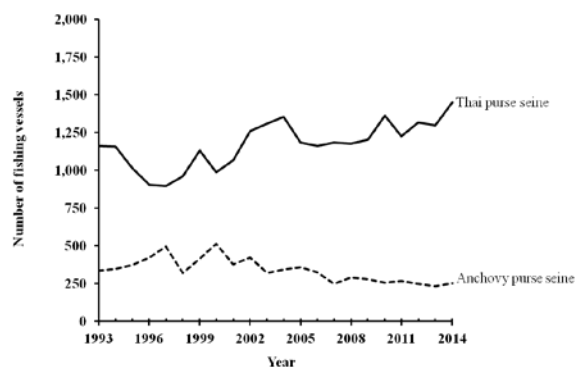
Length at 1st maturity

Species	TL (cm)	Reference
<i>Rastrelliger branchysoma</i>	15.82	Krajangdara <i>et al.</i> (2001)
<i>R. kanagurta</i>	18.92	Krajangdara <i>et al.</i> (2001)
<i>Sardinella gibbosa</i>	13.12	Krajangdara and Chalee (2003)
<i>Decapterus maruadsi</i>	15.70	Bunluedaj (2003)
<i>Encrasicholina punctifer</i>	6.47	Yakoh <i>et al.</i> (2014)
<i>E. heteroloba</i>	6.44	Yakoh <i>et al.</i> (2014)
<i>E. devisi</i>	7.21	Yakoh <i>et al.</i> (2014)

3. Fishing effort for purse seine fisheries

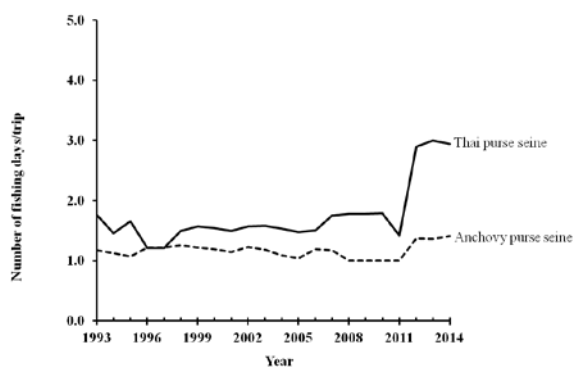
17

Total number of purse seine boat



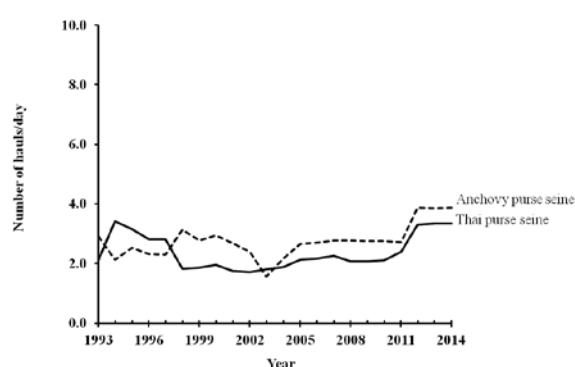
18

Average number of fishing day per trip



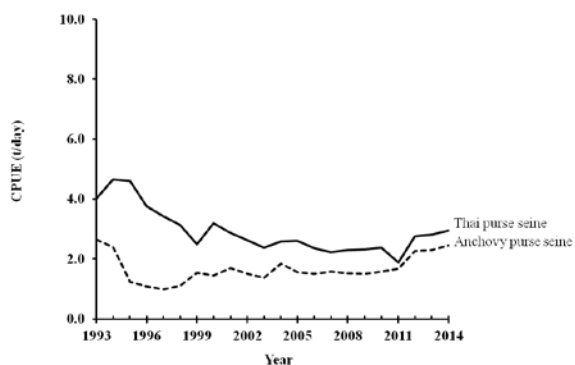
19

Average number of hauls per day



20

Catch per unit effort (CPUE)



21

4. Status on pelagic fish stock

22

Maximum sustainable yield (MSY) VS Catch (DOF and CCCIF, 2017)

Group	Area	MSY (t) (A)	Catch (t) (B)	(B)/(A)
Pelagic	GOT	248,176	245,986	0.99
	ANS	118,477	99,039	0.84
	All	366,653	345,025	0.94
Anchovies	GOT	191,785	183,216	0.96
	ANS	32,944	33,903	1.03
	All	224,729	217,119	0.97

23

5. Existing management strategies

24

- **Mesh size:** ≥ 25 mm for Thai purse seine and ≥ 6 mm for anchovy purse seine
- **Fishing time:** only daytime operation is allowed for anchovy purse seine
- **Closed seasons:** 4 periods in GOT and 1 period in ANS
- **Closed areas:** Trad Bay, 3 nm from shore and 1.5 nm around any island

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THANK
YOU!!!



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**THE 3rd CORE EXPERT MEETING ON “COMPARATIVE
STUDIES FOR MANAGEMENT OF PURSE SEINE FISHERIES
IN THE SOUTHEAST ASIAN REGION”
(JAPANESE TRUST FUND VI)**



**Kuala Lumpur, Malaysia
12-14 September 2017**

***Country Presentation*
VIET NAM**

The Purse Seine Fisheries in Viet Nam

by

**Mr. Pham Van Tuyen
Presenter
Research Institute for Marine Fisheries (RIMF), Viet Nam**

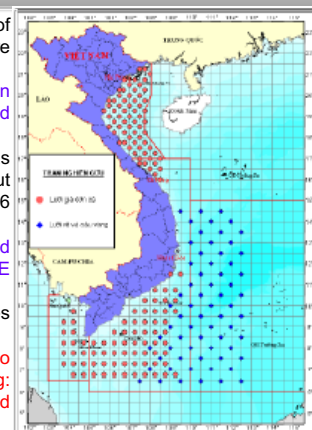
The Purse Seine Fisheries in Vietnam

Pham Van Tuyen¹ and Nguyen Dang Kien²

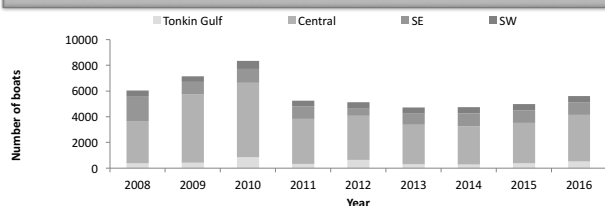
1. RIMF, Vietnam
2. D-fish, Vietnam

OVERVIEW OF MARINE CAPTURE FISHERIES

- Viet Nam has a long coastline of 3,260 km; and a large EEZ of more than 1 million km²;
- Marine Captured Fisheries plays an important role in the social and economic development;
- The number of fishing boats has increased rapidly from about 79,996 units (2007) up to 108,706 units (2016);
- The productions were increased during past decade but CPUE decreased;
- Vietnam fisheries are multi-species and multi-fishing gears.
- The marine waters are divided into 4 management areas, including: Tonkin Gulf, Central, Southeast and Southwest.



FISHING BOATS & ZONES



Year	Numbers of fishing boats				Total
	Tonkin Gulf	Central	SE	SW	
2008	29,582	36,342	23,815	12,492	102,231
2009	34,611	45,186	24,570	15,959	120,326
2010	39,511	47,220	21,490	19,800	128,021
2011	42,659	42,580	26,368	16,756	128,363
2012	40,167	40,713	25,163	17,082	123,125
2013	38,836	38,734	24,065	15,381	117,016
2014	30,860	38,144	21,311	14,771	105,086
2015	32,377	38,339	21,771	14,821	107,308
2016	34,490	37,397	22,140	14,679	108,706

PURSE SEINE FISHERIES

- Purse seine is one of the most important types of fishing gear in the marine fishing sector of Vietnam.
- It is the fishing gear having the potential for operation in offshore areas.
- The marine product from the purse seine is about 20.6% of the total catch.
- The main species of the local and commercial types of surrounding net are small pelagic fish and include: sardine, mackerel, round scad, neretic tunas, anchovy etc.

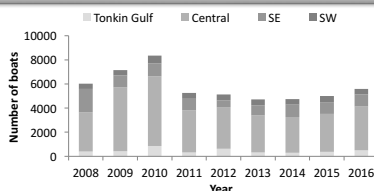
NUMBERS OF PURSE SEINE BOAT

The purse seine were well developed in the Central and the Southeast.

The purse seine in the Gulf Tonkin and Central waters were increased from 2008 to 2016.

In the Southeast, were decreased.

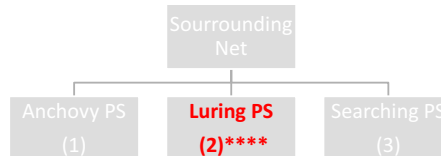
In the Southwest, were stabilized.



Year	Numbers of purse seine fishing boats				Total
	Gulf tonkin	Central	Southeast	Southwest	
2008	386	3,270	1,942	435	6,033
2009	418	5,300	1,002	435	7,155
2010	849	5,784	1,076	639	8,348
2011	326	3,496	962	477	5,261
2012	640	3,438	559	486	5,123
2013	312	3,066	856	492	4,726
2014	291	2,976	1,008	478	4,696
2015	383	3,147	969	493	4,992
2016	513	3,627	979	484	5,603

PURSE SEINE

- Classification of fishing gears in Vietnam: (Surrounding Net):



- Almostly, purse seines were made in Vietnam by fishermen or small private company which had been many experience in activities fishing of PS.
- Beside, RIMF was interested in improving purse seine (Luring PS (1990), Searching (2000)).

TYPE OF PURSE SEINE

Luring Purse Seine

- Anchovy purse seine: target on anchovy
- Luring purse seine: for small pelagics fishes;

Searching Purse Seine

- Small pelagic fish purse seines;
- Tuna purse seine;



ACHOVY PURSE SEINE

- The net is 200-450 m long and 40-60 m deep.
- Mesh sizes is from 6-10 mm
- The materials used for the net are 210D/6-210D/ 12.
- The boat are about 11 - 21m long with engines of 60 - 350Hp and have generators with a capacity of 10-20 kW that are used for luring anchovy and other fish schools.



LURING PURSE SEINE

❖ The luring purse seine:

- This is very popular throughout the whole country.
- The length of the net is about 500 - 900 m and the depth of the net is about 60 - 140 m.
- The mesh size is about 18 -25mm.
- The purse seine have generators a capacity 30 - 60kW are used for the lure lights; about 30 - 60 fishing attraction light, each bulb have capacity 500 – 1,000w.

Area	Length (m)	Depth (m)	Mesh size (mm)		
			Wing	Body of net	Bunt
Gulf Tonkin	600 - 800	80 – 125	24 – 25	24 – 25	20 – 22
Central waters	650 - 900	80 – 130	20 – 25	20 – 25	20 – 24
Southeast	500 - 800	100 – 140	24 – 25	20 – 25	20 – 24
Southwest	500 - 650	60 – 80	20 – 25	20 – 22	18 – 20

THE SEARCHING PURSE SEINE

Have two groups: searching purse seine for catching small pelagic fish

- Small pelagic fish PS (1):

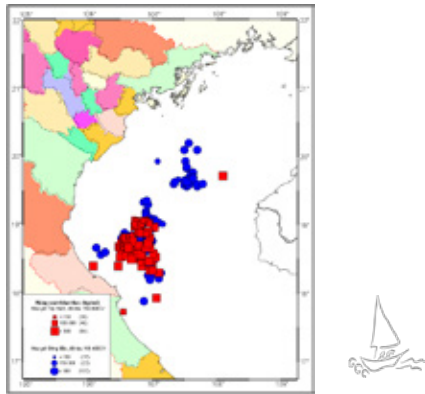
- + The purse seiners must have powerful engines, of a size suitable for operating in the offshore fishing grounds.
- + The boats often use engines of more than 90 up to 450Hp.
- + The sizes of the nets are 500 - 900m long and 60 - 140m deep. Mesh sizes are the same as for the luring method.
- + Fishing operations are conducted during the day or at nighttime.

- Tuna purse seine (2):

- + The purse seines have a length of 600-1,500m and a depth of 70-120 m.
- + In the bunt: mesh size: 30-35mm; the materials: 210D/27; 210D/24; 210D/21;
- + In the body net: mesh size: 25 - 60mm; the materials: 210D/9.
- + In the Wing: mesh size: 30 - 90 mm; the materials: 210D/6.
- + At present, there are many new types of equipment used including: fish finders, scanning sonar, binoculars.

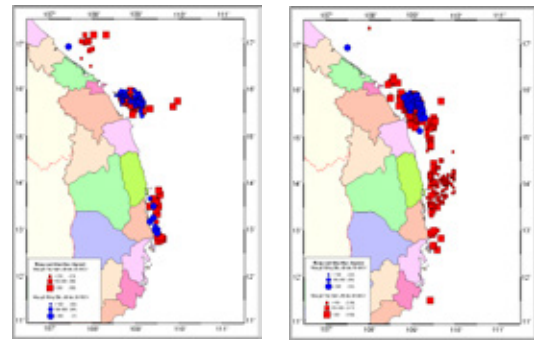
FISHING GROUD OF PS FISHERIES (1)

Fishing ground of purse seine fisheries in Tonkin Gulf



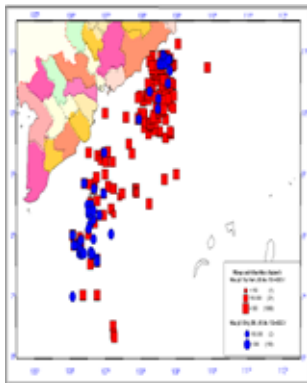
FISHING GROUD PURSE SEINE (2)

Fishing ground of purse seine fisheries in the Central waters (Blue: NE; Red: SW)

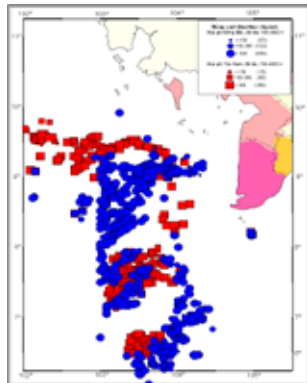


FISHING GROUD PURSE SEINE (4)

Fishing ground of purse seine fisheries in the Southeast waters



Fishing ground of purse seine fisheries in the Southwest waters



FISHING PRODUCTION OF PURSE SEINE FISHERIES

❖ Catches of purse seine fisheries in Vietnam during 2007 – 2015:

- In general, total catch of PS were increased between 2007 and 2015 with every proportion is 21.2%.
- In the Tonkin Gulf and Southeast were decreased, while the Central waters and Southwest were increased.

Area	Annual catches (1,000 tones) of purse seiners (HP>=90)								
	2007	2008	2009	2010	2011	2012	2013	2014	2015
Tonkin Gulf	31.0	17.4	12.8	11.3	12.0	15.7	16.7	17.0	33.5
Central waters	29.0	43.9	50.9	68.3	94.4	82.5	91.0	111.7	229.4
Southeast	65.8	59.4	63.0	68.5	66.2	61.6	52.9	60.9	86.3
Southwest	23.3	58.0	64.6	63.9	64.4	55.4	66.3	66.6	85.0
Total	149.1	178.7	191.3	212.0	237.0	215.2	226.9	256.2	434.2

DOMINANT SPECIES – P/S

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No	Common name (EN)	Scientific name
1	Yellowtail scad	Atule mate
2	Wolf-herring	Chirocentrus dorab
3	Dolphin fish	Coryphaena spp.
4	Shortfin Scad	Decapterus macrosoma
5	Japanese scad	Decapterus maruadsi
6	Torpedo scad	Megalaspis cordyla
7	Black Pomfret	Parastromateus niger
8	brachysoma	Rastrelliger brachysoma
9	Indian Mackerel	Rastrelliger kanagurta
10	Herring	Sardinella spp.
11	Japanese mackerel	Scomber spp.
12	Scomberoides	Scomberoides spp.
13	Bigeye scad	Selar spp.
14	yellowstripe scad	Selaroides leptolepis
15	Barracuda	Sphyraena spp.
16	Anchovy	Stolephorus spp.
17	Japanese horse mackerel	Trachurus japonicus
18	Hairtail	Trichiurus spp.

BIOLOGICAL INFORMATION

Estimated mature length of some species captured by PS in Vietnam waters.

English name	Scientific name	Lm50 - cm	Notes
Bullet tuna	<i>Auxis rochei</i>	25.5	
Frigate tuna	<i>Auxis thazard</i>	30.5	
Kawakawa	<i>Euthynnus affinis</i>	40.0	
Skipjack tuna	<i>Katsuwonus pelamis</i>	40.3 ^F 40.5 ^M	
Yellowtail scad	<i>Atule mate</i>	16.8	SW
Japanese scad	<i>Decapterus maruadsi</i>	17.3, 19.8, 16.4	TG, Ce, SE
Indian mackerel	<i>Rastrelliger kanagurta</i>	18.3, 18.2, 18.9, 16.4	TG, Ce, SE, SW
yellowstripe scad	<i>Selaroides leptolepis</i>	9.8	SW
Shorthead anchovy	<i>Encrasicholina heteroloba</i>	6.1, 4.9	TG, SW
Buccaneer anchovy	<i>Encrasicholina punctifer</i>	5.3	Ce

SPAWNING SEASON

A number of economic fishes have early reproduction age, one year-old fish can reproduce, most of fishes reproduce many times in a year.

The spawning season lasts for long time, most of fishes spawn in the southwest monsoon season which coincide with rainy season when the seawater temperature is high, salinity is low, planktons, especially phytoplankton is feed for small fishes in the initial growth period.

The mainly breeding grounds are the near shore areas, especially in large estuaries. The central seawaters with high depth, high salinity are breeding grounds for some species of oceanic pelagic fishes. In near shore seawaters of Thailand Gulf, the changes of hydrological conditions are not clearly seasonal.

However, most of species were observed in the southwest monsoon and that is the spawning season (April - October).

FISHING EFFORT OF PS FISHERIES

- In general, fishing effort was increased in 2008 and 2014.

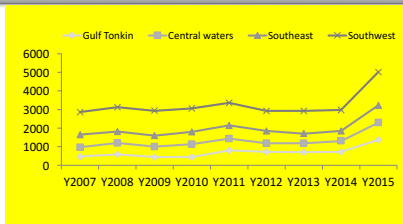
- Fishing effort in the SE&SW is higher than in the central and Tokin Gulf.

Area	Y2008 (past)			Y2014 (moment)		
	Hauls/day	Days/trip	Days/month	Hauls/day	Days/trip	Days/month
Gulf Tonkin	1-2	7.6	13.9	1.5	11.1	15.5
Central waters	1-2	8.2	15.4	1.6	17.6	18.4
SE	2-3	31.7	16.7	2.7	28.3	17.7
SW	2-3	17.7	15.5	2.2	25.2	19.4
Mean		16.3	15.4	2.0	20.5	17.8

CPUE OF PURSE SEINE BOAT

- In general, the CPUE was increased during 2007-2011, but decreased 2011-2014. In 2015, CPUE was enhanced again.

- CPUE of purse seine boat in southwest is higher than Gulf Tonkin, central southeast because PS boat in this area is mainly using anchovy PS.



Area	CPUE (kg/boat/day)									
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2015
Gulf Tonkin	473.9	583.6	443.6	445.1	798.0	726.4	700.0	725.6	1,370.7	7
Central waters	499.0	621.7	564.8	696.2	630.5	458.4	486.1	584.1	921.2	
Southeast	682.2	603.4	586.5	650.8	715.1	658.2	522.4	544.6	939.5	
Southwest	1,210.0	1,315.1	3	1	8	7	1	2	20	

STATUS OF PELAGIC FISH STOCK

- In general, the estimated standing biomass of the marine fisheries resources in Vietnam 2011-2015, at 4.36 million tons (ranging from 4.1 to 4.6 million tons) in which small pelagic fishes about 2,650 thousand tons; demersal fishes are 683 thousand tons and oceanic pelagic fishes are 1,031 thousand tons.

- Small pelagic fish stock show in each area.

Area	2011-2015		2000-2005
	Biomass	MSY	Biomass
Gulf Tonkin	626.0	375.6	433.1
Central water	616.4	369.9	595.5
Southeast	891.5	534.9	770.8
Southwest	510.5	306.3	945.4
Total	2,644.4	1,586.7	2,744.8

FISHERIES MANAGERMENTS

- Fisheries management, Vietnam has issued legal documents such as Fisheries Law (2003) and Decrees (33), Circulars (02/2006, 62/2006).

- Recently, Vietnam Government has issued "Master plan on fisheries development of Vietnam to 2020, vision to 2030".

In which:
+ By 2020, to stabilize exploitation fisheries output of 2.4 million tones.

+ Number of fishing boat in the whole VN: 110,000 units (2020), 95,000 units (2030).

+ There are some research proposed of limited the season areas and fishing areas which are being studied.



REGULATIONS REACTION TO PURSE SEINE

- **Minimum mesh size at the bunt at Circulars 02/2006:**

+ Anchovy purse seine: 10 mm

+ Luring purse seine: 18 mm

- **Minimum length of some small pelagic at Circulars 62/2008:**

TT	Vietnamese name	Scientific name	(cm)
1	Cá Trích xương	<i>Sardinella jussieu</i>	8
2	Cá Trích tròn	<i>Sardinella aurita</i>	10
3	Cá Cơm	<i>Anchoviella spp.</i>	5
4	Cá nục sỏ	<i>Decapterus maruadsi</i>	12
5	Cá Chỉ vàng	<i>Selaroides leptolepis</i>	9
6	Cá Thu chấm	<i>Scomberomorus guttatus</i>	32
7	Cá Thu nhạt	<i>Scomber japonicus</i>	20
8	Cá Ngừ chủ	<i>Auxis thazard</i>	22
9	Cá Ngừ chấm	<i>Euthynnus affinis</i>	36
10	Cá Bạc má	<i>Rastrelliger kanagurta</i>	15

- Beside, regulations of fishing restrict area, time at Circulars 62/2008...

REMARKS

ISSUES

- Decrease of the marine fisheries resources all waters of Viet Nam;
- Fishing techniques backward;
- The assessment research of fish stocks, biological for target species are difficult to lack of funds;
- The level of education of fishermen are low.
- The implementation of management regulations are limited at fishermen communities.
- No effective management tools for purse seine fisheries;

FUTURE WORKS

- Raise continuously knowledge, especially for coastal fishermen communities.
- Strengthening capacity for various stakeholders (scientists, managers, policy makers, fishermen, etc.);
- Collaborative comprehensive study for managements;

RIMF and D-FISH

Thanks for your attention!





**THE 3rd CORE EXPERT MEETING ON “COMPARATIVE
STUDIES FOR MANAGEMENT OF PURSE SEINE FISHERIES
IN THE SOUTHEAST ASIAN REGION”
(JAPANESE TRUST FUND VI)**



**Kuala Lumpur, Malaysia
12-14 September 2017**

Review on current Purse Seine Management Systems
THAILAND

Experience and Lesson-Learned on Total Allowable Catch (TAC) Implementation

by

Cdr. Pornchai Singhaboon
Presenter
Department of Fisheries, Thailand

Experience and Lesson-learned on Total Allowable Catch (TAC) Implementation in Thailand

Marine Fisheries Research and Development Division
Department of Fisheries, THAILAND

Pornchai Singhaboon, Cdr.

1

Outline

1. Introduction
2. TAC implementation
3. Future improvement on TAC implementation

2

Outline

- 1. Introduction**
2. TAC implementation
3. Future improvement on TAC implementation

3

Total allowable catch (TAC)

There are 3 general processes for TAC;

1. Maximum sustainable yield (MSY) is estimated for 3 groups of marine resource



4

2. TAC is considered about **90%** of MSY for all fishing activities



3. TAC is submitted to the National Fishery Committee for approving

5

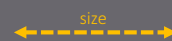
Right-allocation

Approved TAC is allocated to fishers on the basis of

type of fishing gear



size of fishing boat



fishing effort



catch per unit effort (CPUE)

UNIT

6

TAC for all fishing activities

Area	Fish group	Approved TAC (t)
Gulf of Thailand	Benthic	715,294
	Pelagic	230,803
	Anchovy	172,607
Andaman Sea	Benthic	216,467
	Pelagic	110,184
	Anchovy	29,650

Resources utilization by purse seiners

Area	Fish group	Proportion from all fishing activities (%)
Gulf of Thailand	Pelagic	88
	Anchovy	41
Andaman Sea	Pelagic	90
	Anchovy	39

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Right-allocation for anchovy purse seiners in the Gulf of Thailand

Boat (GT)	Allocation (t)	Number of boat	Fishing day	CPUE (kg/day)	Catch (t/year/boat)
<10	3,516	17	235	880	207
10 – 19	5,758	25	235	980	230
20 – 59	17,146	57	235	1,280	301
60 – 149	36,789	101	235	1,550	364
≥150	9,419	24	235	1,670	392

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Outline

1. Introduction
2. TAC implementation
3. Future improvement on TAC implementation

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TAC implementation

- TAC has been implemented since 2016
 - Every 2 years, fishing license must be renewed
- Right-allocation is also reconsidered every 2 years (next time in 2018) from MSY and TAC
 - MSY and TAC is recalculated every year

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Limitation

- TAC needs catch monitoring system
- Consequently, TAC was indirectly applied using TAE (Total allowable effort)
- However, the system is still improving



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Total Allowable Effort (TAE)

- TAE (fishing day) is easily monitored and controlled by port in - port out (PIPO) system
- Fishing day can be calculated from cruising time
- Fishing vessels ≥ 30GT must report the cruising time of every trip

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Fishing day calculation

“Cruising time (T)” to “Fishing day (D)”

- $T < 24$ hours

$$D = 1$$

- $T \geq 24$ hours

$$D = T/24$$

(round down if < 0.5 or round up if ≥ 0.5)



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TAE for purse seiners in Thailand

Area	Type	TAE (day/year)
Gulf of Thailand	Thai purse seine	220
	Anchovy purse seine	235
Andaman Sea	Thai purse seine	235
	Anchovy purse seine	205

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Outline

1. Introduction
2. TAC implementation
3. Future improvement on TAC implementation

16

Improvement on TAC implementation

- Development on catch monitoring system, such as real-time data submission from fishing ports
- Expansion the PIPO system to enforce fishing vessels < 30 GT
- Enforcement on discard ban
- TAC will be fully implemented within 4 years

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Future management measures for purse seine fishing in Thai waters

- Fishing zones for FAD and light luring operations
- Number of FAD per purse seiner
- Number of light boat per purse seiner
- Bycatch limit (bycatch quota), it will be effective under discard ban

18

Thank you for your attention

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**THE 3rd CORE EXPERT MEETING ON “COMPARATIVE
STUDIES FOR MANAGEMENT OF PURSE SEINE FISHERIES
IN THE SOUTHEAST ASIAN REGION”
(JAPANESE TRUST FUND VI)**



**Kuala Lumpur, Malaysia
12-14 September 2017**

Review on Current Purse Seine Management Systems
THE PHILIPPINES

**Experiences and Lessons Learned on the Establishment of Reference Points for
Philippine Fisheries Management**

by

**Mr. Ronnie Romero
Ms. Grace D. V. Lopez
Presenter**

National Fisheries Research and Development Institute, Philippines

Experiences and Lessons Learned on the Establishment of Reference Points for Philippine Fisheries Management

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OIC, Vertebrates Section

NATIONAL FISHERIES RESEARCH AND DEVELOPMENT INSTITUTE
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Telefax. No. (02) 352-3596

National Fisheries Legislation



- Republic Act (RA) 8550 "The Philippine Fisheries Code of 1998) as amended by RA 10654 "An Act to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing"

- Comprehensive National Fisheries Industry Development Plan

(Medium-Term Plan for 2016-2020)

- **Capture** (1% annual growth in Municipal fisheries and 5% annual growth for commercial fisheries)
- **Aquaculture** (Increase on production of Seaweeds, crustaceans, mollusks and finfish)
- **Post-Harvest** (10% reduction in PH losses and 100% compliance on hygiene and sanitation standards)
- **Marketing** (Increase in Quantity and Value of traded fish and fishery products for Domestic and Export)



1018

Initiatives Towards Fisheries Management in Relation to RPs

- E-EAFM Trainings
- Localized M-EAFM Modules
- Mainstreaming EAFM (M-EAFM)
- Institutionalization of FMAs, RPs, HCRs
- Demarcation and Topographical Map of FMAs

1019

1019

Draft Regulation for the Institutionalization of MP, RP, FMA and HCR



Republic of the Philippines
Department of Agriculture
OFFICE OF THE SECRETARY
Cilicala Road, Diliman
Quezon City 1100, Philippines

DEPARTMENT OF AGRICULTURE
ADMINISTRATIVE (CIRCULAR/GUIDELINES)
ORDER NO. _____
Series of 2018



ADOPTING THE PROCESS MANAGEMENT PROCEDURES (MP)
REFERENCE POINTS (RP), FISHERY MANAGEMENT AREAS (FMA) AND HARVEST
CONTROL RULES (HCR)

WHEREAS, Sec 2 (c) of the IRR of RA 8556 as amended by RA 10654 declares as state policy to ensure the rational and sustainable development, management and conservation of the fishery and aquatic resources in Philippine waters (including the Exclusive Economic Zone (EEZ) and in the adjacent high seas, consistent with the primordial objective of maintaining a sound ecological balance, protecting and enhancing the quality of the environment;

Harvest Control Rules (HCR)

SECTION 4:

54. Harvest Control Rules – refers to actions or set of actions to be taken to achieve a medium or long term target reference point while avoiding reaching or breaching a limit reference point.

SEC.8. Harvest Control Rules and Reference Points

- ☐ Fishery Management Area:
 - ✧ Secretary of the DA
 - ✧ LGU in consultation with the FARMC

Section 8.1:

- ✧ 1 Year for TRP, LRP, LRRP and HCR

Harvest Control Rules (HCR) in Commercial Waters

Ideal:

- **Maximum Sustainable Yield (MSY)**
- **Effort Maximum Sustainable Yield (FMSY)**

Actual:

- **Spawning Potential Ratio**
- **Exploitation Rate (e)**

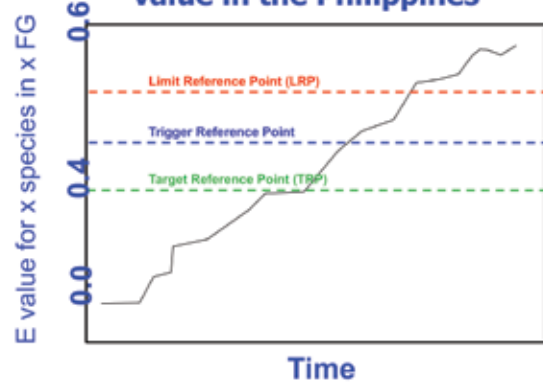
Harvest Control Rules (HCR) in Commercial Waters

- **Mainstreaming**
- **Correlation/ Conversion of e values to production**
- **Candidate Reference Points**
- **Adoption by Regions**
- **Identification of Reference Points per species/ Fishery Management Area**
- **Setting of Limit Reference Point (LRP)**
 - **Sensitivity Analysis**
 - **Trigger Reference Points**
 - **Target Reference Points (TRP)**
 - **Consultation with Managers/ Scientists/ Stakeholders**
 - **Monitor, Evaluate and Adopt**

Harvest Control Rules (HCR) in Municipal Waters

- Guidelines/ Framework for Policy Management
- Adoption of the LGUs via Ordinance
- Correlation/ Conversion of *e* values to production
- Candidate Reference Points
- Adoption by Regions
- Identification of Reference Points per species/ Fishery Management Area
- Setting of Limit Reference Point (LRP)
 - Sensitivity Analysis
 - Trigger Reference Points
 - Target Reference Points (TRP)
 - Consultation with Managers/ Scientists/ Stakeholders
 - Monitor, Evaluate and Adopt

Example for RP using exploitation value in the Philippines



Harvest Control Rules (HCR) Implementation

Rule 8.2. Harvest Control Rules for Limit Reference Points. – Once the LRP is reached, the following HCR shall be implemented after compliance with Rule 65.2:

- Limitation on fishing effort.
- Determination of priority access for renewal of licenses. –
- Declaration of a closed season.
- Reduction by attrition. –
- Other measures.

Rule 8.3. Review.

Rule 8.4. Harvest Control Rules in Municipal Waters

Main considerations for FMA delineation

- Stock range/boundaries
- Fisheries structure
- Administrative divisio



Updates on FMA demarcation

- Central Philippines
- Southern Philippines

Agencies Involved:

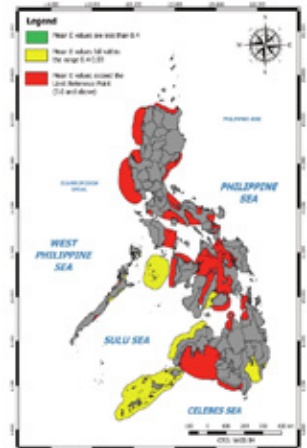
- BFAR/NFRDI

PARTNERS

- NAMRIA, PCG
- ACADEME
- FISHERFOLK & FISHING INDUSTRY
- NGOs
- OTHER STAKEHOLDERS

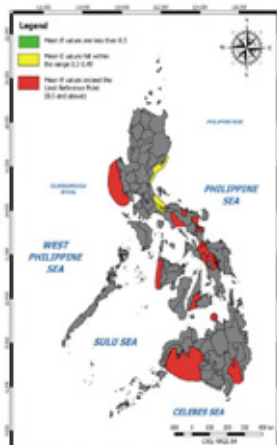
Status of Philippine **small pelagic fishes** by fishing ground based on Exploitation (E) values using NSAP length-frequency data, 2015.

LRP set at E = 0.6



Status of Philippine **neritic tunas** by fishing ground based on Exploitation (E) values using NSAP length-frequency data, 2015.

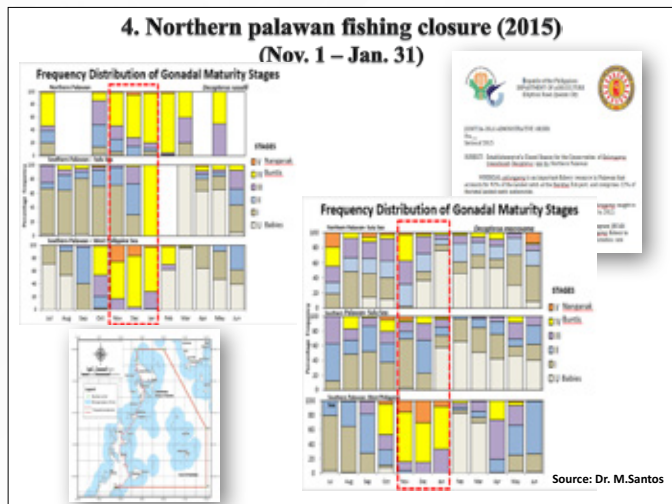
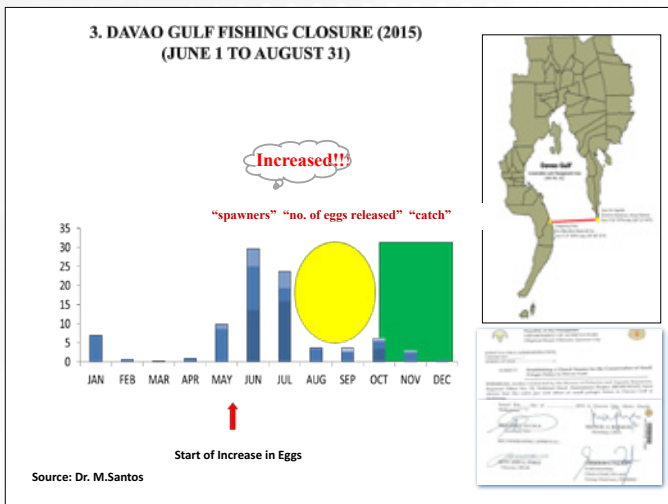
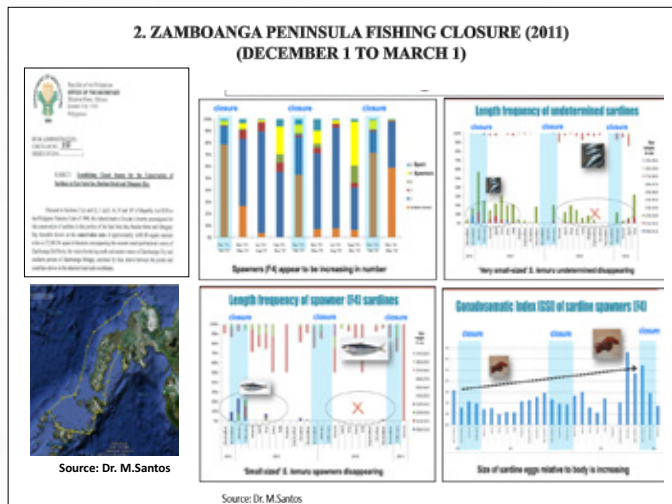
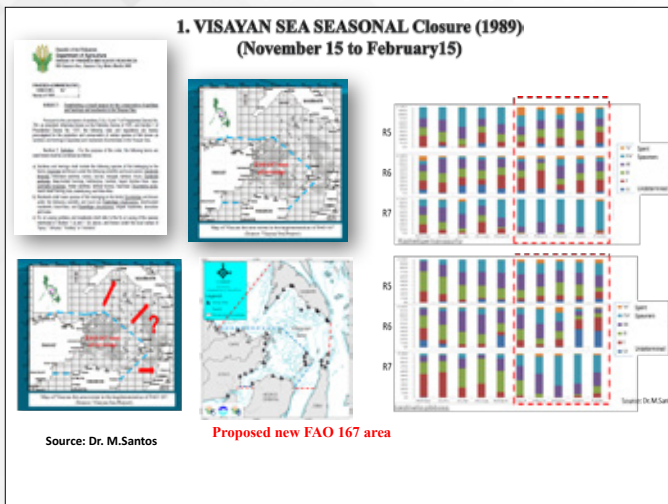
LRP set at E = 0.5



Status of Philippine **oceanic tunas** by fishing ground based on Exploitation (E) values using NSAP length-frequency data, 2015.

LRP set at E = 0.4





LESSONS LEARNED & OPPORTUNITIES

- Stakeholders and players of the industry participation
- The Local Government Units (LGU) played significant roles in EAFM, FMA and Establishment of RPs
- Consistent support from Regional Field Offices
- Philippine- specific modules and process for the M-EAFM
- EAFM played an important role in mainstreaming BFAR Programs
- Strengthened cooperation between the government and the industry towards fisheries management
- Provision of incentives for exemplary individuals, LGUs

1018 USAID OCEAN AND FISHERIES PARTNERSHIP 21

LESSONS LEARNED & OPPORTUNITIES

- The planning process generated actual experiences from key stakeholders to address resource depletion, long-term sustainable development and poverty
- Establishment of comprehensive fisheries management systems
- Pilot-testing of livelihood activities
- Strengthening institutional capabilities of stakeholders in fisheries management
- Closure is an effective way in fisheries management

1018 USAID OCEAN AND FISHERIES PARTNERSHIP 22

Maraming salamat po!

September 12, 2017 Kuala Lumpur, Malaysia 3rd Core Expert Meeting on Cooperative Studies for Management of Pelagic Fisheries in the Southeast Asian Region 23



**THE 3rd CORE EXPERT MEETING ON “COMPARATIVE
STUDIES FOR MANAGEMENT OF PURSE SEINE FISHERIES
IN THE SOUTHEAST ASIAN REGION”
(JAPANESE TRUST FUND VI)**



**Kuala Lumpur, Malaysia
12-14 September 2017**

Regional Data Analysis

Stock Assessment of Sardine in Japan

by

**Prof. Dr. Takashi Matsuishi
Resource person
Hokkaido University**

Examples of Pelagic Fish Stock Management in Japan



Takashi Matsuishi, Ph. D.
Faculty of Fisheries Sciences
Hokkaido University

1

The aim of the presentation

- ☞ To provide an example of age based method
 - To consider future scope of the pelagic resources management in ASEAN area.
- ☞ Sardine in Pacific coast of Japan
 - Advanced example of stock assessment
- ☞ Decision procedure
 - Careful consensus making

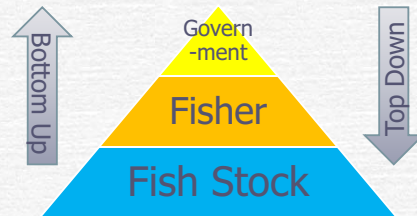
2

TYPES OF MANAGEMENT

3

Types of Fisheries Management

- ☞ Bottom up Control
 - Control by the fishers themselves
- ☞ Top Down Control
 - Control from Government



4

Types of Fisheries Management

- ☞ Input Control
 - Control of Fishing Effort
- ☞ Output Control
 - Control of Catch



5

Japanese Fisheries Management

	Input Ctrl	Output Ctrl
Bottom Up Ctrl	CBFM	
Top Down Ctrl	Fishing Rights Licence TAE	TAC

6

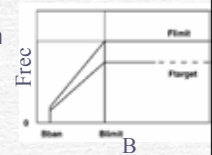
ABC and TAC

- ☞ ABC: Allowable Biological Catch
 - Recommended maximum catch by scientist
 - For 50 species
- ☞ TAC: Total Allowable Catch
 - Set by Nation
 - Based on ABC
 - Consider the socio-economic aspect
 - For 7 very important species

7

ABC rule (rough abstract)

- ☞ Depending on the availability of data
- ☞ Rule 1-1: Biomass and SSB
 - $F_{ABC} = F_{MSY}$ ($B \geq B_{limit}$)
 - $F_{ABC} = F_{rec}$ ($B < B_{limit}$)
- ☞ Rule 1-2: Production Model
 - $F_{ABC} = F_{MSY}$ ($B \geq B_{limit}$)
 - $F_{ABC} = F_{rec}$ ($B < B_{limit}$)
- ☞ Rule 1-3: Biomass but Data Limited
 - $F_{ABC} = F_{CURRENT}$ (B: Good)
 - $F_{ABC} = \beta_1 F_{CURRENT}$ (B: Middium or Decreasing) $\beta_1 \leq 1.0$
 - $F_{ABC} = \beta_2 F_{CURRENT}$ (B: Bad) $\beta_2 < 1.0$

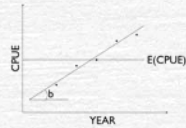


8

ABC rule (cont.)

- Rule 2-1: C and CPUE(Quantitative Stock Level Index)

- $ABC = \delta_1 C_{\text{current}} \gamma_1$
 - $\gamma_1 = 1 + b/E(\text{CPUE})$
 - b : tangent of CPUE $E(\text{CPUE})$: average
 - $\delta_1 = 1.0(\text{Good, Medium}), 0.8(\text{Bad})$



- Rule 2-2: C and Categorized Stock Level

- $ABC = \delta_2 C_{\text{current}} \gamma_2$
 - $\gamma_2 = 1 + b/2E(C)$
 - b : tangent of C $E(C)$: average
 - $\delta_2 = 1.0(\text{Good, Medium}), 0.8(\text{Bad})$

9

Stock assessment of sardine in Pacific coast of Japan FY2016

assessed by FRA

10

Sardine イワシ 鰯

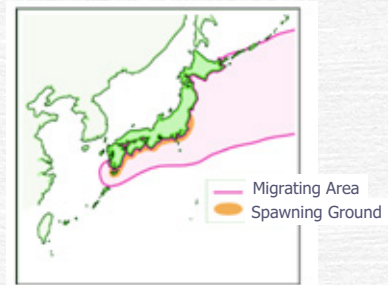
Sardinops melanostictus



- 20cm at age 4
- Very common in 1980's but disappeared from latter 1990's

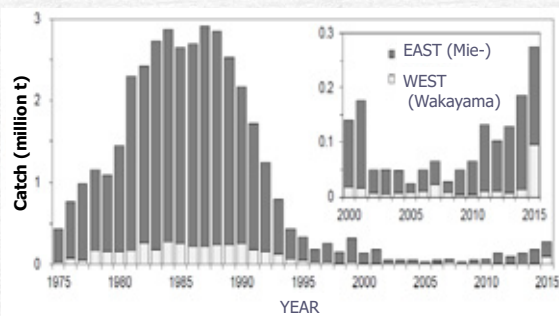
11

Distribution



12

Catch of Sardine in Japan



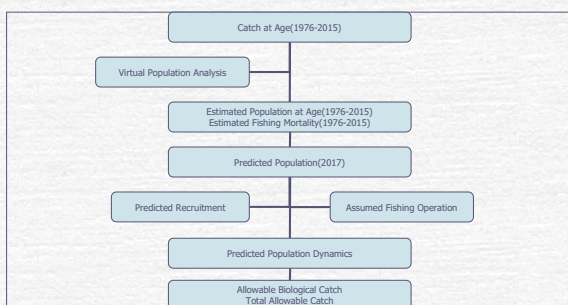
13

Catch statistics in Japan

- All landed fish is weighted in the market at port by FCA and reported to local government immediately.
- Main purpose of the weighting is to calculate the price of fish, and commission fee of FCA
- Data source is not statistical purpose.

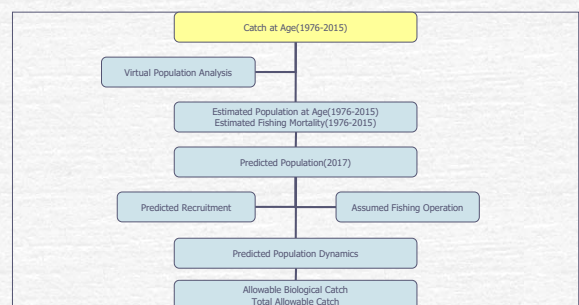
14

Procedure of Stock Assessment



15

Procedure of Stock Assessment



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Estimation of Catch at Age

1. Collect Biological Sample (Number of classes will be 10-20 . 20-100 per each length class.)
2. Aging from Otolith.
3. Estimate age proportion in each length class (Age Length Key ALK)
4. Measure fish length and weight from random sample of catch (10,000 or more)
5. Divide into length class
6. Estimate age composition from ALK
7. Estimate sampling rate from sample weight and total catch weight
8. Estimate catch at age from Total catch weight, average individual weight, and age composition.

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Simple example of ALK

BL (mm)	ALK		
	1	2	3
80-100	100%	0	0
100-120	20%	70%	10%
120-140	0	20%	80%

Virtual data

18

Catch at Length

BL (mm)	Length Composition	Catch at Length
80-100	30%	3,000
100-120	50%	5,000
120-140	20%	2,000
Total	100%	10,000

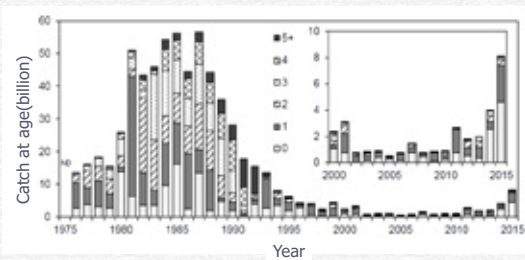
19

Calculation of catch at age

BL(mm)	Age	Age			Total
		1	2	3	
80-100	ALK	100%	0	0	100%
	#fish	3000	0	0	3,000
100-120	ALK	20%	70%	10%	100%
	#fish	1000	3500	500	5,000
120-140	ALK	0	20%	80%	100%
	#fish	0	400	1600	2,000
Total		4000	3900	2100	10,000

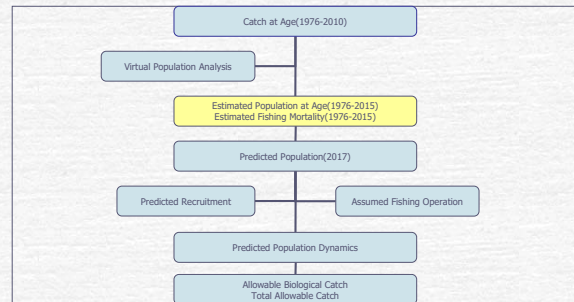
20

Catch at age for Sardine



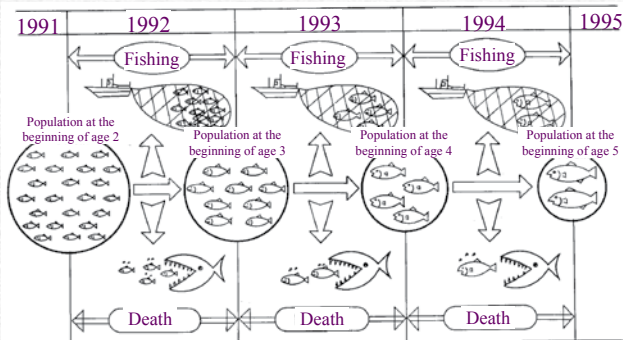
21

Procedure of Stock Assessment



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Virtual Population Analysis (VPA)



資源管理のABCより

23

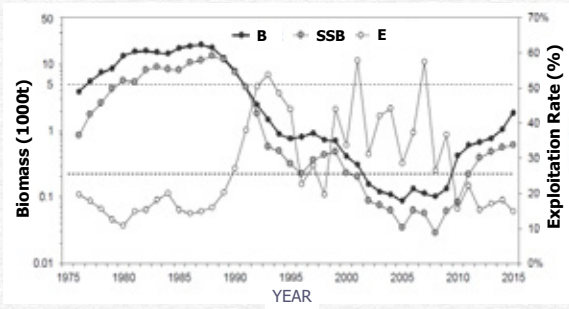
Result of VPA (part)

Population at Age (million)		2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
0歳	1,248	1,426	2,495	1,306	10,180	6,399	6,934	7,772	13,919	56,116	
1歳	1,077	695	342	1,297	837	6,653	3,667	4,227	4,939	7,239	
2歳	115	342	114	83	301	229	3,011	1,956	2,167	2,846	
3歳	49	42	61	47	32	74	91	1,552	865	1,057	
4歳	22	14	11	28	23	10	37	40	844	337	
5歳 and more	5	5	5	8	18	13	5	24	33	518	
Total	2,517	2,524	3,029	2,859	11,451	13,377	13,745	15,572	22,768	68,112	

Estimated Biomass (1000t), SSB(1000t), RPS(ind/kg)		2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
0歳	27	38	64	30	303	195	183	174	338	1,106	
1歳	87	37	19	88	64	365	205	232	268	291	
2歳	10	32	9	8	42	25	265	176	211	250	
3歳	6	4	7	5	4	9	11	174	103	111	
4歳	3	2	1	3	3	1	5	5	107	40	
5歳 and more	1	1	1	1	2	2	1	4	5	60	
Total	132	113	101	135	417	597	669	765	1,033	1,857	
SSB	62	56	28	61	82	219	384	475	561	606	
RPS	20.1	25.3	88.0	22.9	123.8	29.2	18.1	16.4	24.8	92.6	

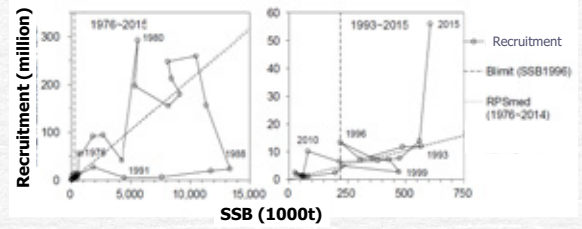
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Estimated Biomass (B) and Exploitation Ratio (E)



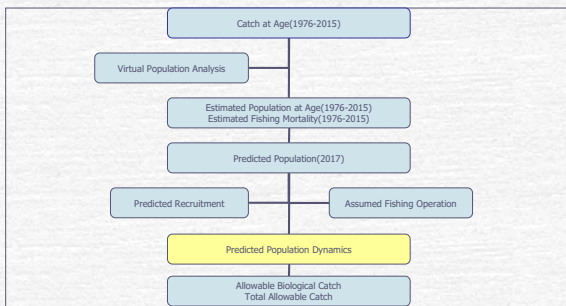
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Stock Recruitment Relationship



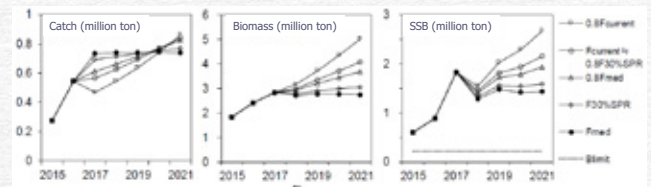
26

Procedure of Stock Assessment



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Population Dynamics Prediction

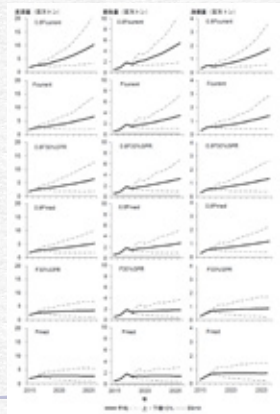


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Simulation

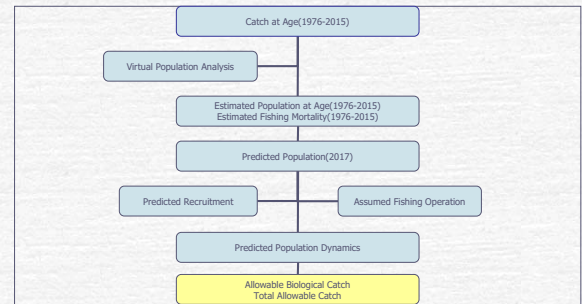
Many simulations for examine the uncertainty of prediction.

- 0.8Fcurrent
- Fcurrent
- 0.8F30%SPR
- 0.8Fmed
- F30%SPR
- Fmed



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Procedure of Stock Assessment



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Allowable Biological Catch

ABC is predicted catch in the fishing mortality that the population is sustainable.

Scenarios	F/Fcur	E	C2021	Aver. C2017-2021	Prob. B>Blimit	Prob. SSB>SSBcur	ABC 2017
Current Fisheries	1.0	20%	414-1458Kt	690Kt	100%	100%	135Kt
SSB rehabilitation	1.28	24%	370-1391Kt	745Kt	99%	96%	210Kt
Keep current SSB	1.37	26%	353-1340Kt	750Kt	93%	93%	236Kt

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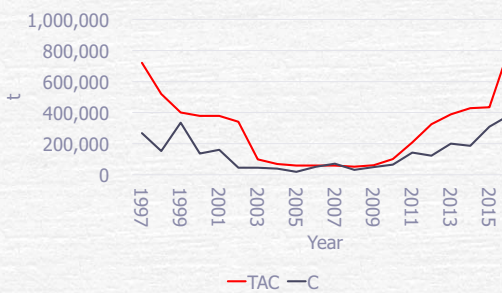
Total Allowable Catch TAC

TAC was also decided based on ABC by Fisheries Agency Japan with taking into account economical and social considerations.

Fishing operation will be stopped when the cumulative landing exceed the TAC.

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TAC and Catch of Sardine



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Procedure to Determine TAC

- ☞ Data Collection
- ☞ Population Assessment
- ☞ Hearing to Fisher group
- ☞ Internal meeting in FRA to ABC
- ☞ Preparation meeting with External Adviser
- ☞ Block Stock Assessment Meeting with External Adviser and Fishers (Open)
- ☞ Meeting with Fishers Group
- ☞ Invite Public Comments
- ☞ Final Determination of ABC in National Wide Stock Assessment Meeting
- ☞ Hearing to Fishers Group and Prefecture
- ☞ Final Determination of TAC in the Fishery Policy Counsel under Minister

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Data used in this scheme

- ☞ Catch statistics for all region and all fisheries for long time (over 3 generations).
- ☞ Result of age determination for every year from large sampling work.
- ☞ Real time monitoring of the landing in every ports to know the achievement of the cumulative catch to TAC.

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**THE 3rd CORE EXPERT MEETING ON “COMPARATIVE
STUDIES FOR MANAGEMENT OF PURSE SEINE FISHERIES
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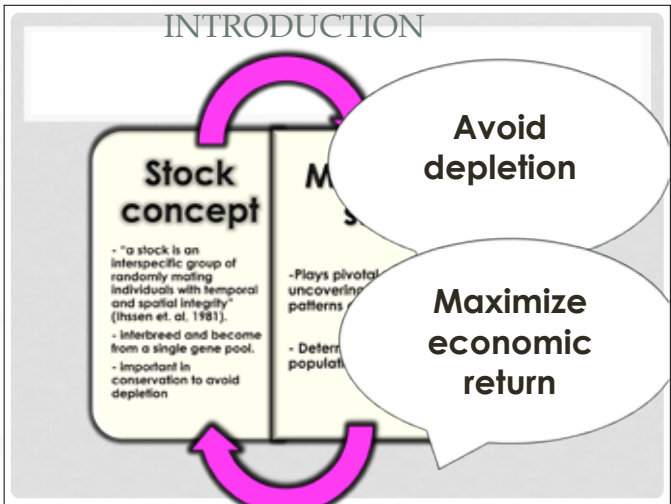
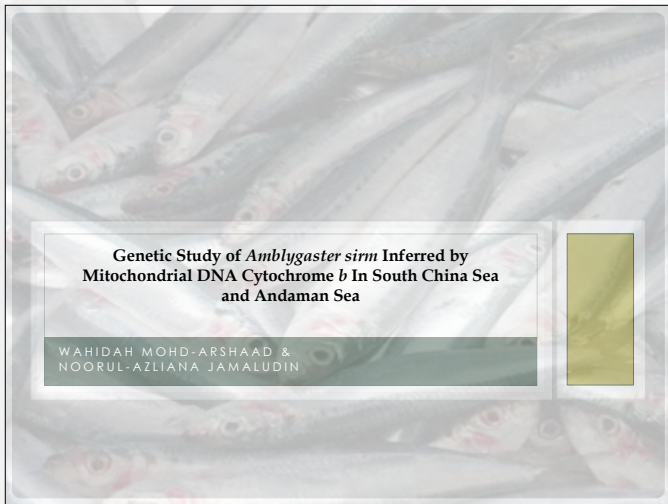
**Kuala Lumpur, Malaysia
12-14 September 2017**

Regional Data Analysis

**Genetic study of *Amblygaster sirm* inferred by mitochondria DNA Cytochrome b in
South China Sea and Andaman Sea**

by

**Ms. Wahidah Mohd Arshaad
Senior Researcher
SEAFDEC/MFRDMD**

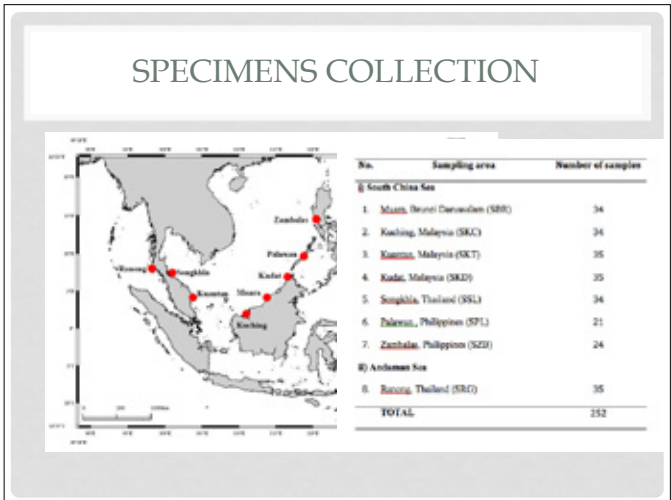
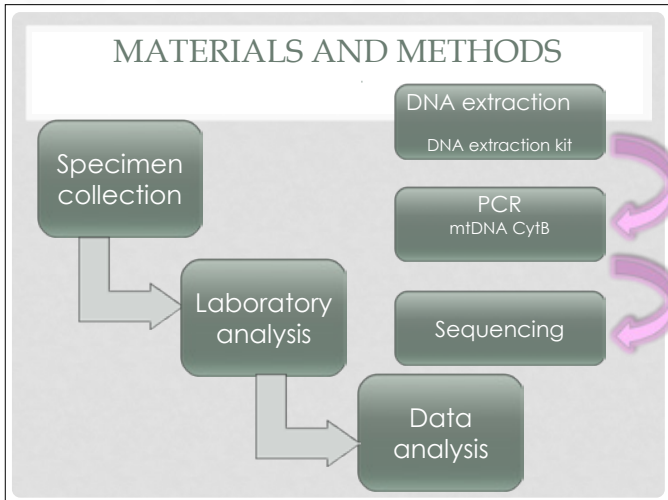


INTRODUCTION

- CEM in 2016 had agreed to choose *Amblygaster sirm* as the targeted species for genetic population study and mtDNA cytochrome *b* as the genetic marker.
- Based from the previous result and also presented in CEM 2016, **no significant or homogenous structure of *Amblygaster sirm* in 4 locations in South China Sea** (Kudat, Kuantan, Muara and Songkhla).
- This is concordant with stock concept by Ihssen et al., 1981.

OBJECTIVES

- To identify the level of genetic diversity of Spotted sardinella (*Amblygaster sirm*) in the South China Sea and Andaman Sea.
- To identify the genetic structure of Spotted sardinella (*Amblygaster sirm*) in the South China Sea and Andaman Sea by using mitochondrial DNA (mtDNA) cytochrome *b* (cyt *b*) marker.

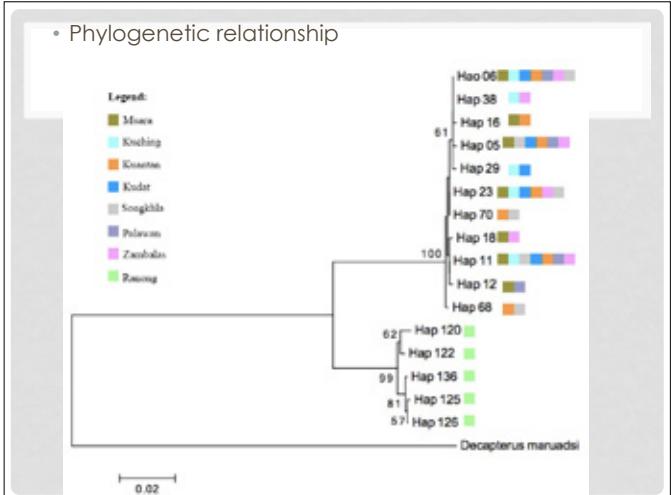


RESULTS

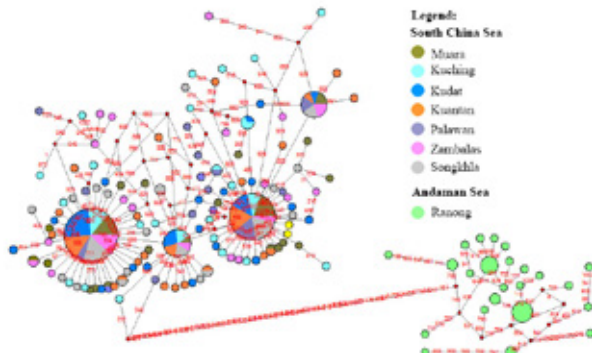
• General result

Locality	N	Number of haplotypes	Polymorphic site	Hd	Nd
SBR	34	23	32	0.9447	0.003
SKC	34	26	38	0.9733	0.004
SKD	35	21	24	0.9092	0.002
SKT	35	24	30	0.9479	0.003
SPL	21	15	18	0.9429	0.003
SSL	34	20	28	0.9305	0.003
SZB	24	19	27	0.9601	0.004
SRG	35	23	44	0.9529	0.007

*Hd= Haplotype diversity
*Nd = Nucleotide diversity



MSN Network



Genetic distance

	SBR	SKC	SKD	SKT	SPL	SSL	SZB	SRG
SBR	0.003							
SKC	0.003	0.004						
SKD	0.003	0.003	0.002					
SKT	0.003	0.003	0.002	0.003				
SPL	0.003	0.003	0.003	0.003	0.003			
SSL	0.003	0.003	0.002	0.003	0.003	0.003		
SZB	0.003	0.004	0.003	0.003	0.003	0.003	0.004	
SRG	0.072	0.072	0.071	0.071	0.072	0.072	0.072	0.007

Among populations – 0.3 to 7.2%
 Within populations – 0.3-0.7%

Fst analysis

	SBR	SKC	SKD	SKT	SPL	SSL	SZB	SRG
SBR	0.0000							
SKC	0.0006	0.0000						
SKD	0.0065	0.0113	0.0000					
SKT	0.0043	0.0001	0.0120	0.0000				
SPL	0.0391	0.0137	0.0369	0.0407	0.0000			
SSL	0.0024	0.0008	0.0130	0.0056	0.0071	0.0000		
SZB	0.0012	0.0103	0.0095	0.0108	0.0324	0.0112	0.0000	
SRG	0.9359	0.9325	0.9368	0.9369	0.9317	0.9565	0.9504	0.0000

■ significant difference

DISCUSSIONS

- Based from the result, a homogenous structure among South China Sea was formed inferred from mtDNA Cyt *b* gene.
- However, a separated unit between South China Sea populations and Andaman Sea was formed based from the genetic result.
- Few possibility might be occurred such as cryptic species based from the genetic distance among population in Ranong and others (>2%).

Carpenter, K.E., Barber, P.H., Crandall, E.D., Ablan-Lagman, M.C.A., Ambariyanto, Mahardika, G.N., ... Toha, A.H.A. (2011). Comparative phylogeography of the Coral Triangle and implications for marine management. *Journal of Marine Biology*, 2011, 1-14. doi: 10.1155/2011/396982

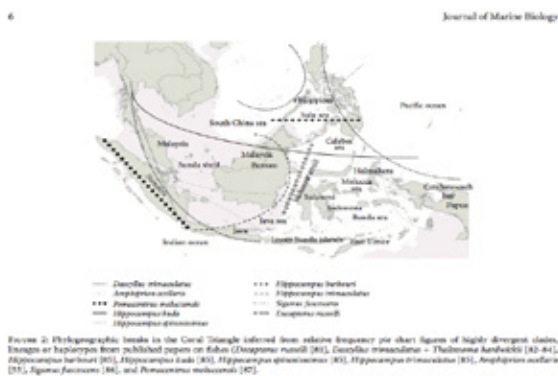


FIGURE 2 | Phylogeographic breaks in the Coral Triangle inferred from relative frequency pie charts figures of highly divergent clades, lineages of haplogroups from published papers on fishes (*Acanogaster russellii* [86], *Diacyllus minoratus* = *Thalassoma aeneum* [83-84], *Amphigenia barlowi* [85], *Amphigenia fada* [82], *Amphigenia spiniventris* [87], *Amphigenia minorata* [81], *Amphigenia aculeata* [83], *Sigambra fuscicornis* [88], and *Pseudoceros malaccensis* [82]).

RECOMMENDATIONS

- To add extra locations from Andaman Sea.
- To do morphometric analysis to confirm the species.
- To do barcoding analysis to see the barcoding gap among the samples of *Amblygaster sirm*.
- To try another genetic marker : e.g. nuclear DNA.

CONCLUSION

- Based from mitochondria DNA Cytochrome *b* analysis of 252 samples from eight locations, a separated stock of *Amblygaster sirm* between South China Sea and Andaman Sea.

THANK YOU



**THE 3rd CORE EXPERT MEETING ON “COMPARATIVE
STUDIES FOR MANAGEMENT OF PURSE SEINE FISHERIES
IN THE SOUTHEAST ASIAN REGION”
(JAPANESE TRUST FUND VI)**



**Kuala Lumpur, Malaysia
12-14 September 2017**

Related to Management Strategy of Purse Seine Fishery

Total Allowable Catch (TAC) Management for Multi-species Fisheries

by

**Prof. Dr. Takashi Matsuishi
Resource person
Hokkaido University**

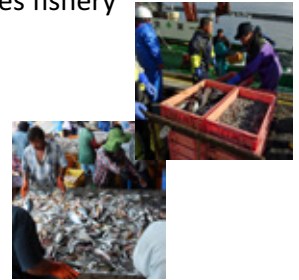
TAC Management for Multi-species Fisheries

MATSUISHI Takashi Fritz

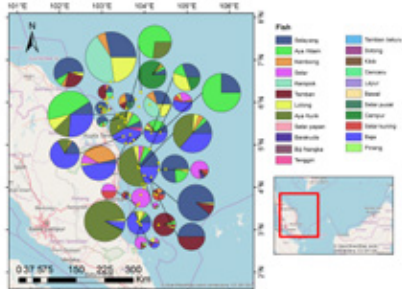
Faculty of Fisheries Sciences, Hokkaido university

Multi-species fishery

- Catch several species at one haul
- Difficult to control the species composition
 - Purse seine
 - Set net fishery
 - Gill net



Species Composition and Fishing Position of Purse seiners in East Coast of Peninsula Malaysia



TAC for single species applied to multi-species fisheries

Assume:

- Fisher can not control species composition
- One or Few specific species are declined and need to stop fishing.

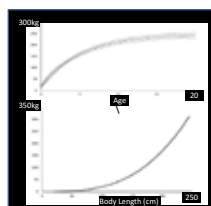


Pacific Bluefin Tuna クロマグロ 本鮪 *Thunnus orientalis*



Growth

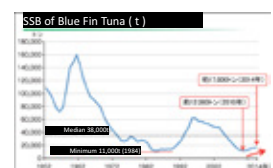
- Age 0 19cm 0.2kg
- Age 1 59cm 4.4kg
- Age 2 91cm 16kg
- Age 3 119cm 35kg
- Age 4 141cm 58kg
- Age 5 160cm 85kg



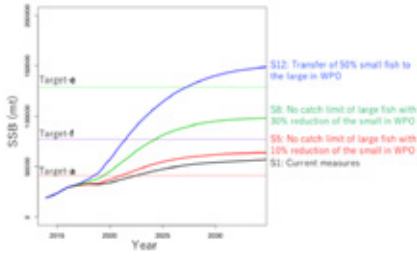
- Age at maturity : Age 4

Pacific Bluefin Tuna Management

- Managed by WCPFC (The Western and Central Pacific Fisheries Commission)
- Population is in Low level
- WCPFC made a target to rehabilitate to 38,000t until 2024
- By reduce the catch of small tuna until half level to current catch



Estimated Trajectory



Japanese Regulation for PBF

- Small PBF <30kg
- TAC=4000t / year
- Purse seine 2000t
- Coastal Fishery 2000t
- Allocated to area block
- If cumulative catch reaches to TAC, basically fishing should be stopped.
- If catch exceed TAC, TAC of the next year should be reduced.

Set net Fishery

- Salmon
- Squid
- Tuna
- Yellowfin
- Atka Mackerel
- Sardine
- Can not select



July 2017

- Quota for small PBF for Hokkaido was 58t during July 2017- June 2018
- Total catch of small PBF exceeded the quota in **only 4 days**.



Possible Solutions (personal opinion)

- Quota Transfer from selective gear (Purse seine)
- Seasonal closure
- Development of the gear which allow small tuna escapement
- Revision of Stock Assessment
 - Recruit estimation is difficult.
 - “Precautional” prediction is recommended
 - In this case, underestimation of population estimation is suspected

Suggestion for Purse Seine

- Understanding of the multi-species situation
 - Mixture of single species targeting vessel
 - Possibility of species selection (depth, fishing ground)
 - Species composition by fishing location
- Flexibility in the implementation
 - Quota transfer
 - Allowed range of by-catch
- Monitoring scheme



**THE 3rd CORE EXPERT MEETING ON “COMPARATIVE
STUDIES FOR MANAGEMENT OF PURSE SEINE FISHERIES
IN THE SOUTHEAST ASIAN REGION”
(JAPANESE TRUST FUND VI)**



**Kuala Lumpur, Malaysia
12-14 September 2017**

Related to Management Strategy of Purse Seine Fishery

Introduction to the Concept of Fisheries Management Plan (FMP)

by

**Mr. Raja Bidin Raja Hassan
Chief of SEAFDEC/MFRDMD**

INTRODUCTION TO THE CONCEPT OF FISHERIES MANAGEMENT PLAN (FMP)

Raja Bidin Raja Hassan
SEAFDEC/MFRDMD

Definition of FMP

- A regulation related to a fishery law/enactment/provision based on scientific information to monitor the activities of developing, retaining, or conserving the stock of the fishery resources

EAFM FMP



(National EAFM Framework).

- New Approach toward updating conventional management through;
 - Consultation with stakeholders
 - Starting from beginning development of fisheries management
- To consider stakeholders opinion before any regulation or rules are developed
- To improve compliance due to collective approach

3

DEVELOPMENT PROCESS FOR FMP

- COUNTRY EAFM



FMP PROCESS

Steps 1 to 3: Scope the fishery, identify issues and prioritize.

- The first step is to identify the fisheries management unit (FMU) that will form the geographical basis for the plan. The final choice of FMU and geographic area for a management plan will depend on a number of practical considerations, but at the very least it should cover all harvesting sub-sectors, both small-scale artisanal and large-scale industrial.

EXAMPLE FOR FMP IN AUSTRALIA AND USA

1. **AUSTRALIA**
AUSTRALIAN FISHERIES MANAGEMENT AUTHORITY (AFMA)
2. **UNITED STATES**
REGIONAL FISHERIES MANAGEMENT COUNCILS (RFMC)

AUSTRALIA Fisheries Management Authority (AFMA)

1. Bass Strait Central Zone Scallop Fishery
2. Coral Sea Fishery
3. Norfolk Island Fishery
4. Northern Prawn Fishery
5. North West Slope Trawl Fishery
6. Small Pelagic Fishery
7. Southern and Eastern Scalefish and Shark Fishery
8. Commonwealth Trawl and Scalefish Hook sectors
9. East Coast Deepwater Trawl Sector
10. Great Australian Bight Trawl Sector

27 FMA

AUSTRALIA Fisheries Management Authority (AFMA)

11. Shark Gillnet and Shark Hook sectors
12. Southern Squid Jig Fishery
13. Western Deepwater Trawl Fishery
14. South Tasman Rise Trawl Fishery
15. Torres Strait fisheries
16. Torres Strait Finfish Fishery
17. Torres Strait Tropical Rock Lobster Fishery
18. Torres Strait Prawn Fishery
19. Torres Strait Bêche-de-mer and Trochus fisheries
20. International fishery management arrangements

AUSTRALIA Fisheries Management Authority (AFMA)

21. Eastern Tuna and Billfish Fishery
22. Skipjack Tuna Fishery
23. Southern Bluefin Tuna Fishery
24. Western Tuna and Billfish Fishery
25. Heard Island and McDonald Islands Fishery
26. Macquarie Island Toothfish Fishery
27. High-seas fisheries for non-highly migratory species

AFMA COMMITTEE

The roles of the AFMA Research Committee and the Commonwealth Fisheries Research Advisory Body are to **consider research proposals and prioritise essential research priorities** that contribute to improved management for fisheries.

Management advisory committees and resource assessment groups **provide crucial advice and input to AFMA** on the management of Commonwealth fisheries. Members of these committees and groups include **AFMA fishery managers, fishing operators, scientists and researchers, state and territory governments, conservation groups and recreational fishers.**

- AFMA Research Committee
- Commonwealth Fisheries Research Advisory Body
- Management advisory committees
- Resource assessment groups
- Small Pelagic Fishery Scientific Panel and Stakeholder Forum
- The Commonwealth Fisheries Marine Mammal Working Group
- Audit and Risk Committee

Scallop Management Advisory Committee

Members

- Mr John Pollock, Chair
- Ms Sally Weekes, AFMA member
- Associate Professor Brendan Kelaher, scientific member
- Mr Allan Barnett, industry member
- Mr John Hammond, industry member
- Mr Stuart Richey, industry member
- Mr Steve Mantzaris, industry member
- Mr Andrew Watts, industry member
- Dr Sylvia Zukowski, environment/conservation member
- Mr James Parkinson, state government (Tasmania)
- Ms Darci Wallis, state government (Victoria)

Contact
Sally Weekes
Fisheries Manager
Tel: 02 6255 5555
Email: sally.weekes@afma.gov.au

BSCZ Scallop FMP



Bass Strait Central Zone Scallop Fishery Management Plan 2002

I. FRANK MEERE, Managing Director of the Australian Fisheries Management Authority, make this Management Plan under section 17 of the Fisheries Management Act 1991.

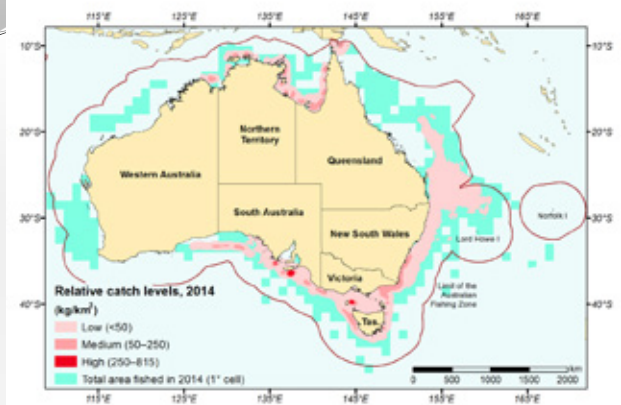
Dated 3 September 2002

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AUS FMP

- Status of Stocks 2015



USA FMP

Regional Fishery Management Councils

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) created eight regional fishery management councils (councils) responsible for the fisheries that require conservation and management in their region. The councils are composed of both voting and non-voting members representing the commercial and recreational fishing sectors in addition to environmental, academic, and government interests. Under the MSA, councils are required to:

- Develop and amend Fishery Management Plans
- Convene committees and advisory panels and conduct public meetings
- Develop research priorities in conjunction with a Scientific and Statistical Committee
- Select fishery management options
- Set annual catch limits based on best available science
- Develop and implement rebuilding plans

The Office of Sustainable Fisheries supports the councils by conducting the annual nomination and appointment process, training new members, and facilitating periodic meetings of the Council Coordination Committee.

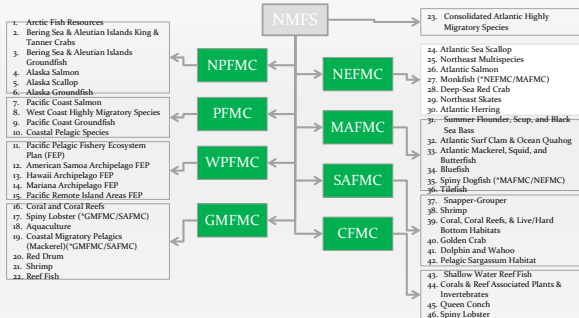
US Regional Fisheries Management Councils (RFMC)

1. North Pacific Fishery Management Council (NPFMC)
2. Pacific Fishery Management Council (PFMC)
3. Western Pacific Fishery Management Council (WPFCM)
4. Gulf of Mexico Fishery Management Council (GMFMC)
5. Caribbean Fishery Management Council (CFMC)
6. South Atlantic Fishery Management Council (SAFMC)
7. Mid-Atlantic Fishery Management Council (MAFMC)
8. New England Fishery Management Council (NEFMC)

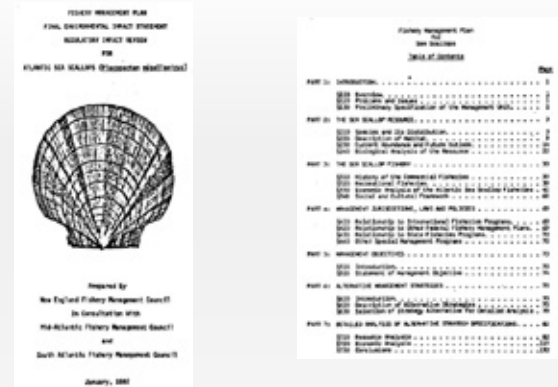
RFMC



FMP USA



ATLANTIC SEA SCALLOP FMP

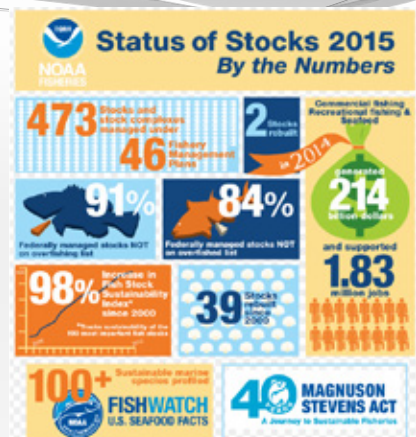


Sea Scallop Plan Overview

- The Atlantic Sea Scallop FMP was implemented in 1982 to restore adult scallop stocks and reduce year-to-year fluctuations in stock abundance caused by variations in recruitment.
- The recovery of the scallop resource and consequent increase in landings and revenues is striking given that average scallop landings per year were below 16 million pounds from 1994-1998, or less than one-third of the present level of landings.
- The dramatic increase in scallop abundance has resulted in the development of a highly profitable commercial fishery in which Atlantic sea scallops are neither overfished, nor is overfishing occurring.

US FMP

- Status of Stocks 2015



FMP CONTENTS

What is a management plan?

Putting it simply, a fishery management plan is a document that:

- Analyzes the *current situation* in a fishery;
- Sets out some *principles* that should be followed in management;
- Details *goals and objectives* for the fishery;
- Says how they are to be *achieved*; and
- Says how they are to be *monitored*.

The best management plans follow the KISS principle - Keep It Short and Simple! As an example, the Canadian plan for Atlantic Mackerel given in Box 1 is only around 16 pages long, excluding the appendices. Although to some extent the length of your management plan will depend on the complexity of your fishery it is well worth remembering that long management plans are rarely necessary.

Successful management plans are working documents constantly referred to by fishery managers and open to changes in the future.

The best management plans follow the KISS principle - Keep it Short and Simple!

FMP CONTENTS

Box 1. An example table of contents for a fishery management plan The Integrated Fisheries Management Plan for Atlantic Mackerel

(see http://www.dfo-mpo.gc.ca/communk/fish_man/mackerel/mpom_e.htm).

1. Introduction - 0.5 page
2. Biological synopsis - 2.5 pages
3. Overview of the Fishery - 3 pages
4. Stock Status - 4 pages
5. Current Management Issues - 0.25 page
6. Long Term Objectives for the Fishery - 0.25 page
7. Specific Management Objectives - 1 page
8. Management Measures - 1 page
9. Enforcement Measures - 1.5 pages
10. Financial Responsibilities - 0.25 page

THANK YOU
TERIMA KASIH



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**Kuala Lumpur, Malaysia
12-14 September 2017**

CLOSING REMARKS

by

**Dr. Kenji Taki
Deputy Chief of SEAFDEC/MFRDMD**

CLOSING REMARKS

Dr. Kenji Taki
Deputy Chief of SEAFDEC/MFRDMD

**The 3rd Core Expert Meeting on “Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region”
(12th – 14th September 2017, Furama Hotel, Kuala Lumpur, Malaysia)**

Chief of SEAFDEC/MFRDMD, *Mr. Raja Bidin Raja Hassan*, our resource person, Dr. Matsuishi from Hokkaido-University, distinguished expertise from participating Member Countries, project leader *Mr. Mohammad Faisal* and my colleagues from SEAFDEC/TD and MFRDMD, Ladies and Gentlemen.

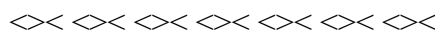
First of all, I would like to appreciate all of you for your active participation in the "Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region".

During the 2 days and a half meeting, we have shared the latest information about landing and CPUEs of Purse Seine fisheries in the region, compiled the current management measures for purse seine fisheries in the region, shared experience on data processing for management of purse seine fisheries, and updated the population structure for *Amblygaster sirm*. For example, the genetic study made an interesting assumption that the stock structure of *A. sirm* between South China Sea and Andaman Sea is separated, which activated discussion. Also, thank you for Dr. Matsuishi, we have deepened our knowledge of stock assessment using age model, decision procedure to TAC and management strategies of multispecies gear by his showing interesting examples in Japan.

I think it was a very good and interesting experience for all of the participants. I believe all of you have understood the best available management regime for purse seine fisheries and population structure for selected pelagic species or gears.

In closing the meeting, I appreciate again for your cooperation. Especially, I really appreciate Dr. Matsuishi for his hard work and contribution to the workshop, which is very much helpful for our upgrading the fisheries management in the region.

My special thanks also go to our Meeting Secretariat working very hard behind the scenes. All your efforts made this workshop very successful. Last but not least, I wish all of you have a safe journey back home. Now I declare the Core Expert Meeting closed. Thank you very much and have a nice day.





The 3rd Core Expert Meeting on Comparative Studies for the Management of Purse Seine Fisheries in the Southeast Asian Region





**Marine Fishery Resources Development and Management Department
Southeast Asian Fisheries Development Center**

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