



**PROJECT DOCUMENT**

**ACHIEVEMENTS FOR YEAR 2019**

<b>Project ID:</b> 2013040102			
<b>Program Category</b>	ASEAN-SEAFDEC ASSP and FCG Mechanism		
<b>Project Title</b>	Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region		
<b>Program Strategy No.</b>	IV	<b>Total Duration</b>	2013 - 2019
<b>Lead Department</b>	Marine Fishery Resources Development and Management Department (MFRDMD)	<b>Lead Country</b>	None
<b>Donor/Sponsor</b>	Japanese Trust Fund (JTF)	<b>Total Donor Budget</b>	USD 316,065
<b>Project Partner</b>	Training Department (TD) and Secretariat (SEC)	<b>Budget for 2019</b>	USD 33,180
<b>Project Leader</b>	Raja Bidin bin Raja Hassan until February 2017 Mohammad Faisal bin Md Saleh since March 2017	<b>Project Participating Country(ies)</b>	Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, the Philippines, Thailand and Vietnam

**PART I: OVERALL PROJECT DESCRIPTION**

**1. Brief Project Description:**

The Project involves the compilation and comparison of annual and/or monthly CPUE where data are available for the last three decades in the region, the comparison of purse seine fisheries management systems/measures including TAC systems and other management measures in the world, the genetic study of a commercially important pelagic species, and the development of management strategies for sustainable purse seine fisheries in the Southeast Asian region. Since catch-effort statistics are available in Malaysia and Thailand and CPUE is an indirect measurement of abundance of a target species in fisheries, MFRDMD makes its first attempt to examine the trend of resource level using CPUE for the last three decades.

MFRDMD also reviews and compares purse seine fishery management systems including TAC systems and other management measures in the world to examine which management system/measures is applicable for the management of small pelagic fishery in the region. Moreover, the genetic study intends to verify the extent of the connectivity of commercially-important pelagic species targeted by purse seine fisheries, and provide with scientific background for concerted management actions of SEAFDEC Member Countries (MCs) for shared stocks of small pelagic species. By the end of the project, MFRDMD could review available information including stock levels, and MFRDMD in cooperation with MCs could examine management strategies for sustainable purse seine fisheries in the region.

## 2. Background and Justification:

Small pelagic fishes such as Indian mackerels, scads and sardinellas are very important in the Southeast Asian region. In 2010, more than 800,000 MT of *Rastrelliger* spp., 700,000 MT of *Decapterus* spp. and 800,000 MT of *Sardinella* spp. were captured in the region. Besides food resources, capture fisheries targeting these fishes are of fundamental importance to this region in terms of employment and livelihood of fishers. Purse seine is one of the major fishing gears to catch those small pelagic fishes. However, the management of purse seine fisheries is still neglected because adequate information of stocks and biological characteristics are lacking. For the sustainable use of these resources, the formulation of a management plan is required. Therefore, we need to develop appropriate way to assess the size and status of the stocks for the accurate TAC allocations and to find the most applicable TAC system for the purse seine fisheries in the region. Considering the likeliness of these stocks shared by the countries bordering with the same ecosystems both in the Andaman Sea and the South China Sea, the effective management of shared stocks requires management measures to be taken for the whole coverage area beyond national waters.

The Project corresponds to #10 of Resolution at the ASEAN-SEAFDEC Conference in 2011 (Strengthen knowledge/science-based development and management of fisheries through enhancing the national capacity in the collection and sharing of fisheries data and information) and #22 of Plan of Action (Establish and strengthen regional and sub-regional coordination on fisheries management and efforts to combat IUU fishing including the development of regional/sub-regional Monitoring, Control and Surveillance (MCS) networks). Considering the importance of the Project in comparative studies for the management of purse seine fisheries, especially having several options for the management strategy of purse seine fisheries in the region, SEAFDEC proposed to expand its project period to 2019.

## 3. Project Overall Objectives, Outcomes, Outputs, Indicators and Activities

### 3.1 Objectives, Outcome and Output of the Project

Objective	Outcomes	Outputs	Activities
<p><b>Objective 1:</b> To compile and compare annual and/or monthly catch per unit effort (CPUE) data for the last three decades in Malaysia and Thailand where historical catch-effort statistics had been collected by SEAFDEC and to interpret the trend of resources in the region</p>	<p><b>Outcome 1:</b> Purse seine CPUE data in Malaysia and Thailand are utilized to interpret the trend of resources in the region</p>	<p>Output 1: Purse seine CPUE data in Malaysia and Thailand are compiled</p>	<p>Activity 1: Comparative Studies for CPUE and TAC 1.1 Case studies for CPUE in the Southeast Asian region</p>
<p><b>Objective 2:</b> To assess which unit of effort is most appropriate for Malaysia, Thailand, and other member countries and to examine other indicators for stock assessment</p>	<p><b>Outcome 2:</b> Suitable indicators for purse seine management in the region are examined</p>	<p>Output 2: Purse seine CPUE and other indicators in member countries are compared and assessed</p>	<p>Activity 1: Comparative Studies for CPUE and TAC 1.2 Suitable CPUE and other indicators for resource levels in member countries</p>

<p><b>Objective 3:</b> To compare existing management systems/measures of purse seine fishery including total allowable catch (TAC) systems in the world to examine which management system/measure is applicable for management of purse seine fishery in the region</p>	<p><b>Outcome 3:</b> Understanding of TAC systems and the other management measures for purse seine in the region is improved.</p>	<p>Output 3: TAC systems and the other management measures in the world for purse seine are compared</p>	<p>Activity 1: Comparative Studies for CPUE and TAC 1.3 Comparison of TAC systems in the world (including other management measures)</p>
<p><b>Objective 4:</b> To compare genetic structures of commercially important small pelagic species in the region by studying one species of the commercially important sardines</p>	<p><b>Outcome 4:</b> Understanding of fish stock structures in the region is improved</p>	<p>Output 4: New genetic data on a pelagic fish species is compiled and analyzed</p>	<p>Activity 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</p>
<p><b>Objective 5:</b> To propose management strategies for sustainable purse seine fisheries in the Southeast Asian region based on available data</p>	<p><b>Outcome 5:</b> Management strategies for sustainable purse seine fisheries in the region based on available data are improved.</p>	<p>Output 5: Core Expert Meeting/Workshop is held for effective program implementation</p>	<p>Activity 3. Meetings for Effective Program Implementation 3.1 Core Expert Meeting/Workshop</p>
		<p>Output 6: Recommendation for management of purse seine fisheries in the region is reported.</p>	<p>Activity 4. Recommendation for Purse Seine Fisheries Management in the Southeast Asian region 4.1 Recommendation for fisheries Management 4.2 Preparation and publishing of terminal report</p>

### 3.2 Overall Scope/Description of Project

Activity	Description
<p>Activity 1 Comparative Studies for CPUE and TAC</p>	<p>As a case study, annual and/or monthly catch per unit effort (CPUE) data will be compiled for the last three decades in Malaysia and Thailand where historical catch-effort statistics had been collected by SEAFDEC. These data will be compared and utilized to interpret the trend of pelagic resources in the region. By using the compiled CPUE data and the other indicators, the most appropriate indicators to assess resource levels for purse seine fishery in the region will be examined. Existing management systems/measures in the world for purse seine fishery including total allowable catch (TAC) systems</p>

	will be compared to examine which management system/measure is applicable for management of purse seine fishery in the region.
Activity 2 Genetic Data Collection and Analysis	Genetic structures of commercially important small pelagic species targeted by purse seine fishery in the region will be studied. One species of the commercially important sardines will be selected. New genetic data on a pelagic fish species is compiled and analyzed to consider appropriate management of purse seine fishery in the region.
Activity 3 Meetings for Effective Program Implementation	2 Core Expert Meetings will be held for effective program implementation. The meetings which are planned in 2014, 2016, 2017, and 2018 will discuss on the planning and progress of Activities 1-2 and draft recommendations for sustainable purse seine fisheries in the Southeast Asian region based on available data.
Activity 4 Recommendation for Purse Seine Fisheries Management in the Southeast Asian region	3 By using the information obtained in Activities 1-3, a terminal report will be published and recommendation will be made available for sustainable purse seine fisheries in the Southeast Asian region based on available information.

### 3.3 Activity, Sub-activity and Proposed Budget for 2015-2019

(Unit: USD)

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017	Y6 2018	Y7 2019
Activity 1: Comparative Studies for CPUE and TAC	Sub-activity 1.1 Case studies for CPUE in the Southeast Asian region	20,000	5,000					
	Sub-activity 1.2 Suitable CPUE and other indicators for resource levels in member countries			10,000	6,500			
	Sub-activity 1.3 Comparison of TAC systems in the world (including other management measures)	25,000	5,000	10,000	6,500	7,933	8,908	
Activity 2: Genetic Data Collection and Analysis	Sub-activity 2.1: Equipment preparation for genetic study	15,000						
	Sub-activity 2.2: Sample collection		8,000	5,000				
	Sub-activity 2.3: Genetic study		9,866	15,972	9,773			
	Sub-activity 2.4: Data compilation and analysis					5,000	9,825	

Activity 3: Meetings for Effective Program Implementation	Sub-activity 3.1: Core Expert Meeting/Workshop		30,394		25,000	21,000	23,214	
Activity 4 Recommendation for Purse Seine Fisheries Management in the Southeast Asian region	Sub-activity 4.1: Recommendation for fisheries Management							24,520
	Sub-activity 4.2: Preparation and publishing of terminal report							8,660
<b>Sub-Total Budget</b>		<b>60,000</b>	<b>58,260</b>	<b>40,972</b>	<b>47,773</b>	<b>33,933</b>	<b>41,947</b>	<b>33,180</b>

## PART II: ACHIEVEMENT OF 2019 PROJECT IMPLEMENTATION

### 1. Achievements of the Project Implementation for the present year <2019>:

MFRDMD continuously analyzed and updated information on purse seine fisheries from MCs as well as examined the data for a regional synthesis of purse seine fisheries to suggest possible suitable stock indicator and management systems in MCs. MFRDMD conducted the Internal Workshop under the project in Kota Bharu, Kelantan, Malaysia from 12 to 14 February 2019. The workshop aimed to enhance the knowledge regarding the fisheries management, and agreed to publish a terminal report of the Japanese Trust Fund (JTF) VI Project by the end of 2019. The workshop also discussed on the direction for the next project under the JTF VI Phase 2.

Report of the 4<sup>th</sup> CEM (2018) was published in May 2019. In addition, Hokkaido University in Japan in collaboration with MFRDMD will publish a scientific paper in an international journal regarding the purse seine fishery in the East Coast of Peninsular Malaysia.

In addition, the preparation of genetic component as complement to the project terminal report was also completed. At the end of 2019, MFRDMD will publish a regional project terminal report entitled “Comparative Studies for Purse Seine Fisheries in the Southeast Asian Region” as the last activity of the project. The terminal report consists of two major components which are comparative and genetic population studies.

### 2. Information of Present Year Activity including Involved Stakeholders:

List of Actual Sub-activity	Type of activity*	Number of Participants			Spent Budget (USD)
		MCs	SEAFDEC	Others	
<b>Activity 4</b>					
Sub-activity 4.1: Recommendation for fisheries management	Workshop		8 (2)	2 (1)	24,520
Sub-activity 4.2: Preparation and publishing of terminal report	Information		All Editorial Team		8,660

*Remarks) Regarding the number of participants, please indicate total number of participants (and number of female participants within), such as 20 (10).*

### 3. Achievements and Expected Outcome/Outputs of the Activity:

Planned activity	Expected	Achievements
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	outcome/output	
<b>Activity 4</b>		
Sub-activity 4.1: Recommendation for fisheries Management	Comparison of TAC systems and management measures for purse seine fishery	<p>MFRDMD had conducted the Internal Workshop for this project in Kota Bharu, Kelantan, Malaysia from 12 to 14 February 2019. This workshop aimed to enhance the knowledge regarding the fisheries management. The workshop agreed to publish the terminal report of the JTFVI project by the end of 2019. The workshop also discussed on the direction for the next project, the JTFVI Phase Two.</p> <p>The report of the 4th CEM (2018) has been published in May 2019. In addition, Hokkaido University, Japan in collaboration with MFRDMD will published a scientific paper in targeted international journal on species composition of purse seine fisheries along the East Coast of Peninsular Malaysia.</p>
Sub-activity 4.2: Preparation and publishing of terminal report		At the end of this year, MFRDMD will published a regional project terminal report entitled “Comparative Studies for Purse Seine Fisheries in the Southeast Asian Region” as the end activity of this project.

**4. List of Completed Publications and Others (e.g. technical report, VDO, presentation file, etc.):**

List of completed publications for the year 2019	Type of media	Attached e-file
1. Meeting report for “The 4 <sup>th</sup> Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region. (SEAFDEC/MFRDMD, 2019).	<b>Pdf, Print</b>	<b>Yes</b>
2. Mohammad Faisal Md Saleh & Nurul Nadwa Abdul Fatah. 2019. Overview of Project. Power point presented at the Internal Workshop on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 12-14 February 2019 in Kota Bharu, Malaysia.	<b>Pdf</b>	<b>Yes</b>
3. Mohammad Faisal Md Saleh & Nurul Nadwa Abdul Fatah. 2019. Outline of Regional Synthesis report. Power point presented at the Internal Workshop on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 12-14 February 2019 in Kota Bharu, Malaysia.	<b>Pdf</b>	<b>Yes</b>
4. Noorul Azliana Jamaluddin, Wahidah Mohd Arshaad, Lawoue’ Sebastien & Noor Adelyna Mohd Akib. A preliminary study of population genetic structure of spotted sardinella, <i>Amblygaster sirm</i> in Malaysian waters. Paper to be presented at International Fisheries Symposium 2019 (IFS 2019) on 18-21 November 2019	<b>Pdf, Print</b>	<b>Yes</b>

in Kuala Lumpur, Malaysia.		
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## 5. Evaluation from Participants of Member Countries for WS and Training Course:

Planned activity	Evaluation/ Views from Participants
Activity 4	N/A

## 6. Major impacts/issues:

Full regional analysis had been influenced by data reliability and validity. Therefore, additional time was needed to complete the preparation and publication of the terminal report.

For genetic study of *Amblygaster sirm*, no samples from Myanmar were acquired. Samples from Myanmar is very important in order to get a better picture of population structure of spotted sardinella around Andaman Sea.

## PART III: ACHIEVEMENTS IN OVERALL PROJECT DURATION

### 1. Abstract of Achievements in the Overall Project Duration (*project duration: 7 years*):

The Project successfully compiled the landing data from purse seine fisheries from eight MCs for two decades from 1996 to 2015 where historical catch-effort statistical data were available. The CPUE per trip was chosen as the most suitable unit of effort to be used for the stock assessment. The TAC system was found not suitable and, other management measures i.e. Feedback Control and Production Model were decided being more appropriate to be used as management measures for purse seine fishery in the Southeast Asian region. Genetic study of one commercially important sardine found that *Amblygaster sirm* from Ranong versus the rest of the populations (South China Sea, Java Sea, Celebes Sea and Andaman Sea (southern part) were two genetically highly divergent stocks, thus it was recommended that these stocks should be independently managed. Some management strategies for sustainable purse seine fisheries were offered as scientific advices to the MCs.

### 2. Implemented Activities/sub-activities in the Overall Project Duration:

List of Activities	Description of Implemented Activities
<b>Activity 1: Comparative Studies for CPUE and TAC</b>	
Sub-activity 1.1 Case studies for CPUE in the Southeast Asian region	The questions for essential information like catch and effort data, species composition, biological information and growth parameters were included into the fundamental template. Next, the templates with official letters was sent to each AMSs within agreed timeframe through mails, e-mails and facsimiles.
Sub-activity 1.2 Suitable CPUE and other indicators for resource levels in member countries	Historical data from 1996-2015 from fisheries statistical system were compiled from each AMS. In addition to that, the up-to-date information was also being informed annually by the representatives of AMSs through e-mails and meetings. Compiled historical data were analyzed to generate suitable CPUE indicators.
Sub-activity 1.3 Comparison of TAC systems	TAC systems and other management measures were examined and compared to find the most applicable measure for purse seine

in the world (including other management measures)	fishery in the SEA region through various meetings, workshops and discussion.
<b>Activity 2: Genetic Data Collection and Analysis</b>	
Sub-activity 2.1: Equipment preparation for genetic study	Necessary chemicals, disposable laboratory consumables, DNA extraction kit, Gel-Doc View Machine and PCR machine were purchased for genetic analysis.
Sub-activity 2.2: Sample collection	<i>Amblygaster sirm</i> was selected as a target species for genetic population structure study. The collection of tissue samples was done by the technical officers of the respective countries following strictly the same standard operating procedure (SOP) supplied. The SOP included tissue sample collection in the field at identified sampling/landing sites and tissue preservation either in the field or at the laboratory.
Sub-activity 2.3: Genetic study	DNA extraction, PCR analysis, sequencing was done by using two types of mitochondrial DNA markers.
Sub-activity 2.4: Data compilation and analysis	Findings of the analysis were compiled and examined carefully. Consultations with local resource persons were held to discuss the findings of data sequence analysis.
<b>Activity 3: Meetings for Effective Program Implementation</b>	
Sub-activity 3.1: Core Expert Meeting/Workshop	Four CEMs: <ul style="list-style-type: none"> <li>i. 1<sup>st</sup> CEM: 26-28 August 2014 (Furama, KL)</li> <li>ii. 2<sup>nd</sup> CEM: 9-11 August 2016 (Furama, KL)</li> <li>iii. 3<sup>rd</sup> CEM: 12-14 September 2017 (Furama, KL)</li> <li>iv. 4<sup>th</sup> CEM: 18-19 September 2018 (Melia, KL)</li> </ul> Seven workshops: <ul style="list-style-type: none"> <li>i. Regional Workshop: 7-8 Mac 2017 (Dorsett, KL)</li> <li>ii. Genetic Workshop: 6-9 August 2018 (Langkawi)</li> <li>iii. 1<sup>st</sup> Internal Workshop: 18-20 November 2013 (Sutra Beach Resort)</li> <li>iv. 2<sup>nd</sup> Internal Workshop: 25-27 November 2014 (Tok Aman Bali)</li> <li>v. 3<sup>rd</sup> Internal Workshop: 6-7 January 2016 (Tok Bali)</li> <li>vi. 4<sup>th</sup> Internal Workshop: 12-14 February 2018 (Dungun)</li> <li>vii. 5<sup>th</sup> Internal Workshop: 12-14 February 2019 (Kota Bharu)</li> </ul>
<b>Activity 4: Recommendation for Purse Seine Fisheries Management in the Southeast Asian region</b>	
Sub-activity 4.1: Recommendation for fisheries Management	Consultations with resource persons (a regional and a local RPs) were held a few times to come out with scientific recommendations related to the possible management measures for purse seine fishery in the SEA region.
Sub-activity 4.2: Preparation and publishing of terminal report	The editorial team of MFRDMD continuously had discussion in preparation and publication of terminal report. Terminal report will be disseminated to the SEAFDEC Member Countries and Departments, partner agencies and other fisheries-related organizations.



### 3. Achievements and Outcomes/Outputs of Activities in the Overall Project Duration:

List of Activities	Achievements and Outcomes/Outputs of Activities
<b>Activity 1: Comparative Studies for CPUE and TAC</b>	
Sub-activity 1.1 Case studies for CPUE in the Southeast Asian region	Annual and/or monthly catch per unit effort (CPUE) data was compiled for the last two decades in eight AMSs where historical catch-effort statistics had been successfully collected by MFRDMD. These data were compared and utilized to interpret the trend of pelagic resources in the region.
Sub-activity 1.2 Suitable CPUE and other indicators for resource levels in member countries	CPUE by trip was found as the most appropriate indicators in assessing resource levels for purse seine fishery in the region.
Sub-activity 1.3 Comparison of TAC systems in the world (including other management measures)	TAC was found not suitable for the multispecies situation in SEA region. Thus, other strategies for management measure such as Feedback Control and Production Model were found to be more applicable for management of purse seine fishery in the region.
<b>Activity 2: Genetic Data Collection and Analysis</b>	
Sub-activity 2.1: Equipment preparation for genetic study	All the items purchased were necessary to facilitate and expedite the laboratory analysis.
Sub-activity 2.2: Sample collection	Maximum 35 tissue samples (fin clip) of <i>Amblygaster sirm</i> from each location were collected at a total of 13 selected representative sampling sites in the South China Sea and Andaman Sea.
Sub-activity 2.3: Genetic study	Two mitochondrial DNA markers were selected for this study which were Cytochrome b (Cyt b) and Cytochrome C Oxidase Subunit I (COI) to determine the genetic structure of <i>Amblygaster sirm</i> in the SEA region.
Sub-activity 2.4: Data compilation and analysis	Both the DNA markers used in this study revealed two highly genetic divergent stocks; Ranong vs the rest of the populations (South China Sea, Java Sea, Celebes Sea and Andaman Sea (southern part)). It is recommended that these stocks should be independently managed.
<b>Activity 3: Meetings for Effective Program Implementation</b>	4
Sub-activity 3.1: Core Expert Meeting/Workshop	Four CEMs and seven workshops have been successfully organized throughout the project duration which discussed on the planning and progress of Activities 1 to 2 and advised some scientific recommendations for sustainable purse seine fisheries in the Southeast Asian region based on available data.
<b>Activity 4: Recommendation for Purse Seine Fisheries Management in the Southeast Asian region</b>	5
Sub-activity 4.1: Recommendation for fisheries Management	Some scientific recommendations such as to improve statistics on purse seine fishery were suggested for sustainable purse seine fisheries in the Southeast Asian region based on the regional analysis.
Sub-activity 4.2:	By using the information obtained in Activities 1 to 3, a terminal

Preparation and publishing of terminal report

report will be published by the end of 2019.

#### 4. Evaluation and Major Impacts/Issues in the Overall Project Duration:

All activities were successfully completed with good cooperation and support from all parties involved. Nevertheless, there were some issues on the reliability of the compiled data because some countries were not able to fulfill all the parameters in timely manner, especially on the number of vessels for fish purse seine and anchovy purse seine. Final analysis was affected because the fishing effort used in calculation of CPUE is the key component of the project. The other issue was since PS fisheries and geopolitics in each MCs differed from others, MCs should manage the purse seine fisheries to fit to their situations accordingly. All MCs should improve their fisheries statistical data system to be more efficient. Thus, detailed catch-effort statistics in the region should be prioritized to uphold accurate information.

For genetic study of *Amblygaster sirm*, there are several difficulties including bureaucratic procedures and legislations in certain MCs to export samples from the countries to MFRDMD, which resulted in uncertainties to the project implementation. Samples for genetic study from some MCs could not be obtained due to misidentification, which revealed some MCs still have difficulties in species identification of small pelagic species. Furthermore, *A. sirm* is not available all year round as it is a seasonal fish resulting in difficulties in sampling at the specific time.

#### 5. Publications and Others (e.g. technical report, VDO, presentation file, etc.):

##### 2013

1. MFRDMD. Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region. Power point presented at the 36<sup>th</sup> Meeting of the Program Committee Southeast Asian Fisheries Development Center (PCM) on 25-29 November 2013 in Penang, Malaysia.

##### 2014

2. Raja Bidin Raja Hassan. Overview of “Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region. Power point presented at the 1<sup>st</sup> Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 26-28 August 2014 in Kuala Lumpur, Malaysia.”
3. Mohammad Faisal Md Saleh. Outputs Presentation for Andaman Sea. Power point presented at the 1<sup>st</sup> Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 26-28 August 2014 in Kuala Lumpur, Malaysia.
4. Wahidah Mohd Arshaad & Noorul Azliana Jamaludin. Genetic Study on *Sardinella* spp in Southeast Asia and Other Region. Power point presented at the 1<sup>st</sup> Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 26-28 August 2014 in Kuala Lumpur, Malaysia.
5. Noorul Azliana Jamaludin & Wahidah Mohd Arshaad. Sampling procedure for the genetic study. Power point presented at the 1<sup>st</sup> Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 26-28 August 2014 in Kuala Lumpur, Malaysia.
6. MFRDMD. Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region. Power point presented at the 37<sup>th</sup> Meeting of the Program Committee Southeast Asian Fisheries Development Center (PCM) on 1-3 December 2014 in Ubon Ratchatani, Thailand.

##### 2015

7. Raja Bidin Raja Hassan. “Current Status of Purse Seine Fisheries in the Southeast Asian Region” iv + 76 pp. (SEAFDEC/MFRDMD, 2015).

8. MFRDMD. Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region. Power point presented at the 38<sup>th</sup> Meeting of the Program Committee Southeast Asian Fisheries Development Center (PCM) on 23-25 December 2015 in Manila, the Philippines.

## 2016

9. Raja Bidin Raja Hassan and Abdul Razak Latun. Purse Seine Fisheries in Southeast Asian Countries: A Regional Synthesis (Fish for The People 14(1): 7-15, 2016).
10. Mohammad Faisal Md Saleh & Raja Bidin Raja Hassan. Regional Synthesis for Current Status of Purse Seine Fisheries in Andaman Sea. Power point presented at the 2<sup>nd</sup> Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 9-11 August 2016 in Kuala Lumpur, Malaysia.
11. Wahidah Mohd Arshaad. Genetic population of Spotted sardinella (*Amblygaster sirm*) in Southeast Asian region. Power point presented at the 2<sup>nd</sup> Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 9-11 August 2016 in Kuala Lumpur, Malaysia.
12. MFRDMD. Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region. Power point presented at the 39<sup>th</sup> Meeting of the Program Committee Southeast Asian Fisheries Development Center (PCM) on 28 - 30 November 2016 in Yogyakarta, Indonesia.
13. MFRDMD. Management strategies and measures for purse seine fishery in the South China Sea. Power point presented at the 19<sup>th</sup> Meeting of Fisheries Consultative Group/ASEAN-SEAFDEC Strategic Partnership (FCG) on 1-2 December 2016 in Yogyakarta, Indonesia.

## 2017

14. Mohammad Faisal Md Saleh & Husaini Mohd Rani. Overview and Progress of Project. Power point presented at the Regional Workshop on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 7-8 March 2017 in Kuala Lumpur, Malaysia.
15. Wahidah Mohd Arshaad & Adam Luke Pugas. Genetic Study of *Amblygaster sirm*: The Progress. Power point presented at the Regional Workshop on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 7-8 March 2017 in Kuala Lumpur, Malaysia.
16. Meeting report for "The Second Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region". (SEAFDEC/MFRDMD, 2017).
17. MFRDMD. Pelagic species in the Southeast Asian region. Power point presented at the Regional Technical Consultation on Fishery Statistics and Information in Southeast Asia (RTC) on 15-18 August 2017 in Bangkok, Thailand.
18. Mohammad Faisal Md Saleh & Nurul Nadwa Abdul Fatah. Overview and Progress of Project. Power point presented at the 3<sup>rd</sup> Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 12-14 September 2017 in Kuala Lumpur, Malaysia.
19. Wahidah Mohd Arshaad & Noorul Azliana Jamaludin. Genetic Study of *Amblygaster sirm* inferred by Mitochondrial DNA Cytochrome b in South China Sea and Andaman Sea. Power point presented at the 3<sup>rd</sup> Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 12-14 September 2017 in Kuala Lumpur, Malaysia.
20. MFRDMD. Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region. Power point presented at the 40<sup>th</sup> Meeting of the Program Committee Southeast Asian Fisheries Development Center (PCM) on 27-29 November 2017 in Bangkok, Thailand.
21. MFRDMD. Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region. Power point presented at the 20<sup>th</sup> Meeting of Fisheries Consultative Group/ASEAN-SEAFDEC Strategic Partnership (FCG) on 30 November - 1 December 2017 in Bangkok, Thailand.
22. Mohammad Faisal Md. Saleh, Wahidah Mohd Arshaad, Raja Bidin Raja Hassan, Noorul Azliana Jamaludin, and Nurul Nadwa Abdul Fatah. Managing Purse Seine Fisheries in the Southeast

Asian Region: a joint effort among ASEAN Member States. (Fish for the People 15(3): 14-16, 2017).

## **2018**

23. Meeting report for “The 3<sup>rd</sup> Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region. (SEAFDEC/MFRDMD, 2018).
24. Wahidah Mohd Arshaad & Noorul Azliana Jamaludin. Genetic Study of *Amblygaster sirm* inferred by Mitochondrial DNA Cytochrome *b* in South China Sea and Andaman Sea. Paper presented at Internal Workshop in UITM Hotel, Dungun Terengganu, Malaysia on 12-14 February 2018.
25. Mohammad Faisal Md Saleh & Nurul Nadwa Abdul Fatah. Overview of Project. Power point presented at the 4<sup>th</sup> Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 18-19 September 2018 in Kuala Lumpur, Malaysia.
26. Mohammad Faisal Md Saleh, Nurul Nadwa Abdul Fatah & Kenji Taki. Output based on regional synthesis. 2018. Power point presented at the 4<sup>th</sup> Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 18-19 September 2018 in Kuala Lumpur, Malaysia.
27. Wahidah Mohd Arshaad & Noorul Azliana Jamaludin. Population Structure of *Amblygaster sirm* in Southeast Asian Region. Paper presented at the 4<sup>th</sup> Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 18-19 September 2018 in Kuala Lumpur, Malaysia.
28. Mohammad Faisal Md Saleh, Nurul Nadwa Abdul Fatah & Kenji Taki. Power point presented at the 41<sup>st</sup> Meeting of the Program Committee Southeast Asian Fisheries Development Center (PCM) on 5-7 November 2018 in Langkawi, Kedah, Malaysia.
29. Poster entitled ‘Comparative Studies for the Management of the Purse Seine Fish.in SEA region’ by Mohammad-Faisal, M. S., Wahidah, M. A., Raja-Bidin, R. H., Abdul-Fatah N.N. and Taki, K.
30. Poster entitled ‘The Major Pelagic Species Caught by Fish Purse Seine in East Coast of Peninsular Malaysia’ by Mohammad Faisal Md Saleh, Osman Muda, Norfaizal Azli Mat Nor and Annie Nunis Billy.
31. Poster entitled ‘Genetic Study of *Amblygaster sirm* inferred by mitochondrial DNA (mtDNA) in South China Sea and Andaman Sea’ by Wahidah M. A., Noorul-Azliana J., Nor Ayuni A., Mohammad-Faisal M. S., Taki K.

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32. Meeting report for “The 4<sup>th</sup> Core Expert Meeting on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region. (SEAFDEC/MFRDMD, 2019).
33. Mohammad Faisal Md Saleh & Nurul Nadwa Abdul Fatah. Overview of Project. Power point presented at the Internal Workshop on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 12-14 February 2019 in Kota Bharu, Malaysia.
34. Mohammad Faisal Md Saleh & Nurul Nadwa Abdul Fatah. Outline of Regional Synthesis report. Power point presented at the Internal Workshop on Comparative Studies for Management of Purse Seine Fisheries in the Southeast Asian Region on 12-14 February 2019 in Kota Bharu, Malaysia.

35. Noorul Azliana Jamaluddin, Wahidah Mohd Arshaad, Lawoue' Sebastien & Noor Adelyna Mohd Akib. A preliminary study of population genetic structure of spotted sardinella, *Amblygaster sirm* in Malaysian waters. Paper to be presented at International Fisheries Symposium 2019 (IFS 2019) on 18-21 November 2019 in Kuala Lumpur, Malaysia.
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