



**PROJECT DOCUMENT**

**ACHIEVEMENTS FOR YEAR 2019**

			<b>Project ID:</b> 201301007
<b>Program Category</b>	ASEAN-SEAFDEC ASSP and FCG Mechanism		
<b>Project Title</b>	Offshore Fisheries Resources Exploration in Southeast Asia		
<b>Program Strategy No.</b>	I	<b>Total Duration</b>	2015 - 2019
<b>Lead Department</b>	Training Department (TD)	<b>Lead Country</b>	None
<b>Donor/Sponsor</b>	Japanese Trust Fund (JTF)	<b>Total Donor Budget:</b>	USD 640,244
<b>Project Partner</b>	None	<b>Budget for 2019</b>	USD 46,940
<b>Project Leader</b>	Ms. Siriporn Pangsorn / TD	<b>Project Participating Country(ies)</b>	All Member Countries

**PART I: OVERALL PROJECT DESCRIPTION**

**1. Brief Project Description:**

Currently, attempts of countries in the Southeast Asia have increasingly focused to expand their fishing activities to the offshore areas in their Exclusive Economic Zones where fisheries resources are still under-utilized as alternative marine fisheries resources. With the Resolution and Plan of Action No. 18 describes that “Investigate the potential of under-utilized fisheries resources and promote their exploitation in a precautionary manner based upon analysis of the best available scientific information”, SEAFDEC has duties to provide technical support to the Member Countries to explore these under-utilized offshore fisheries resources through various programs, *e.g.* Technical meetings, Workshops, and Trainings course in related to fisheries resource exploration, fisheries abundance, as well as stock assessment.

In order to fulfill the needs of the SEAFDEC Member Countries on the exploitation of marine fisheries resources and study on marine environment in the specific area beyond the coastal zone that include offshore and high sea, SEAFDEC/TD works in close collaboration with these Member Countries and other relevant partners at national, sub-regional, and regional and international levels, to conduct marine fisheries resources and study on marine environment with two (2) major specific areas *i.e.* (i) Fisheries research and oceanographic survey; and (ii) Human resource development on fisheries and oceanographic research survey, onboard navigation, and marine engineering training and fish handling onboard fishing vessel.

Since 2004, SEAFDEC has technically supported to Member Countries by utilization Research vessel(s) on the marine fisheries research resources survey beyond coastal area, in EEZs of these Member Countries. The outputs from the survey include cruise reports of the survey, technical documents related to fisheries, marine environment and other specific requirements. The project will also facilitate collaboration research survey in the area where fisheries resources, especially tuna resources such as yellowfin and skipjack, has being shared among the countries in Southeast Asia as well as the marine important species of SEAFDEC Member Countries.

## 2. Background and Justification:

Over the past few years, SEAFDEC Member Countries have increased their interest to promote the exploration of offshore fisheries resources to reduce the pressure of over-exploited fisheries resources in near shore areas in their EEZ, at the same time to find alternative source of fisheries resources. This is in line with the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Regional Towards 2020, as mentioned in the Plan of Action # 18 “Investigate the potential of under-utilized fisheries resources and promote their exploitation in a precautionary manner based upon analysis of the best available scientific information”. In this connection, this project will provide technical support to the Member Countries in exploring the under-utilized fisheries resources beyond the coastal area, including offshore areas in their respective EEZ waters.

Project also encourages and facilitates to SESAFDEC Member Countries the collaborative implements the marine fisheries resources and marine environment research survey. The overall aims of collaborative research survey are to strengthen marine fisheries and environment information collection by research vessel, and to promote the offshore fisheries resources exploration through the research and human resources capacity by utilization of Training and Research Vessel, M.V. SEAFDEC 2.

In this connection, SEAFDEC in close collaboration with the Member Countries has supported exploration of fishery/living resources in the EEZ of the countries in SEA. The overall aims of this project are to encourage Member Countries to collect the information on the offshore fishery resources in terms of research and training facilities using M.V. SEAFDEC 2, and to build human resources capacity for offshore fishery resources exploration. In addition, the project provides technical support to develop human resources development of SEAFDEC Member Countries to improve fish handling onboard through the training program on fish handling techniques applicable to various fishing operations in Southeast Asia. Participants understand the importance of hygienic, cleanliness and important key factors contributing to reduction of post-harvest losses onboard.

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

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

Objective	Outcomes	Outputs	Activities
<b>Objective 1:</b> Organization of the Regional Offshore Fisheries Research Resource Exploration	<b>Outcome 1:</b> Set of data on the fisheries research resource for capture fisheries promotion or fisheries resource management	<b>Output 1:</b> 1.1) A set of scientific data for policy consideration on management and sustainable utilization of oceanic tuna in Sulu and Sulawesi Seas 1.2) Sets of SOPs for assessing the status of tuna resources in region or Sub-region Waters in Southeast Asia	<b>Activity 1:</b> Technical meetings on the results of the tuna fisheries resources survey in Sulu and Sulawesi Seas Progress of the tuna research work, direction and solution of the difficulties on data analysis to support the tuna research in SSSs as well as the future activities will also be discussed at the meeting. <b>Activity 2:</b> Regional (or Sub-regional) consultation to establish research survey for offshore fisheries resources in Southeast Asia Waters by utilization of M.V. SEAFDEC 2 <b>Activity 3:</b> Supporting technical staff(s) of SEAFDEC/TD participate the cruise survey and participate to the technical meetings of

		1.3) Summary Report on the Technical Meeting on the Plan for the Survey Cruise of M.V. SEAFDEC 2 on Small Pelagic Fishery Resources Assessment in Viet Nam Marine Waters and Tentative Cruise Order of M.V. SEAFDEC 2 survey around Waters in Southeast Asia	sub-regional study/research on offshore fisheries resources survey.
<b>Objective 2:</b> Developing for Improving Fish Handling at Sea	<b>Outcome 2:</b> Utilization of fisheries resources through improvement of post-harvest fish handling at sea onboard fishing vessels	<b>Output 2:</b> Report of the regional training course on post-harvest	<b>Activity 4:</b> Organize the regional training course on improvement of post-harvest fish handling at sea
<b>Objective 3:</b> Strengthening quality research survey on offshore fisheries resources, and promote value addition to marine fisheries products in Southeast Asian Region	<b>Outcome 3:</b> Efficiency of research survey on offshore fisheries resources and appropriate improvement of post-harvest fish handling	<b>Output 3:</b> Sampling gear used for fisheries resources survey and/or Promote the materials of the improve Fisheries Research Resource Exploration and package(s) of technical handbooks and training reports on improvement of post-harvest fish handling	<b>Activity 5:</b> Modification of the offshore sampling gears and technical project publications

### 3.2 Overall Scope/Description of Project

Activity	Description
<b>Activity 1:</b> Technical meetings on the	Technical meetings on the results of tuna fisheries resources survey in Sulu and Sulawesi seas. As planned through a series of the technical

results of the tuna fisheries resources survey in Sulu and Sulawesi Seas	meetings on tuna research in Sulu and Sulawesi Seas, preliminary results of M.V. SEAFDEC 2 cruise survey on tuna resources in Sulu and Sulawesi Seas.
<b>Activity 2:</b> Technical consultation and discussion to plan and prepare offshore fisheries resources research survey in Southeast Asia Waters by utilization of M.V. SEAFDEC 2 or other national research vessel	Supporting SEAFDEC technical staffs to conduct the consultation visit on planning of offshore fisheries resources research survey in Southeast Asia Waters by using of M.V. SEAFDEC 2 or other national research vessel.
<b>Activity 3:</b> Technical Support to SEAFDEC staff(s) for participates in the cruise survey and the meetings/ workshop/ symposium	Supporting technical staff(s) of SEAFDEC/TD participate the cruise survey and the meetings/workshop/symposium to promote result of project Offshore Fisheries Resources Exploration in Southeast Asia. In addition, activity has also aimed to facilitate invited expert of SEAFDEC Member Countries technically visit to SEAFDEC for technical collaboration.
<b>Activity 4:</b> Organize the Regional activities (Training/ Workshop/Meeting) on the improvement of the fish handling at sea and study on the assessment of post-harvest loss in Southeast Asia	National or regional activities (Training/Workshop/Meeting) on the improvement of the fish handling at sea aim to identify problem of the post-harvest fish handling both onshore and onboard fishing vessel of SEAFDEC Member Countries and seek for the recommendation on future improvement of post-harvest fish handling both onshore and onboard fishing vessel. Activities include research study to assess post-harvest fish loss in Southeast Asia Region.
<b>Activity 5:</b> Modification of the offshore sampling gears and technical project publications	<p>In order to strengthen research survey on offshore fisheries resources, in particular, the tuna resource research survey in Sulu and Sulawesi Seas, continuation on modification of sampling gear used with M.V. SEAFDEC 2 cruise survey will be carried out. A number of sampling gears will be redesigned.</p> <p>In order to promote value addition marine fisheries products in Southeast Asian Region, promotional materials including with package(s) of technical handbooks and training reports on improvement of post-harvest fish handling will be disseminated through the project website.</p> <p>Project also conduct the compilation and revision of the technical handbook or guideline of SOP on sampling gears and survey methodology for offshore fisheries resources exploration. These publications will be disseminated both by documents and website.</p>

### 3.3 Activity, Sub-activity and Proposed Budget for 2014-2019 (in case of 5-year project from 2015)

(Unit: USD)

Activity	Sub-Activity	Y1 2014	Y2 2015	Y3 2016	Y4 2017	Y5 2018	Y6 2019
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<b>Activity 1:</b> Technical meetings on the results of the tuna fisheries resources survey in Sulu and Sulawesi Seas	Sub-activity 1.1 Technical meetings on the results of the tuna fisheries resources survey in Sulu and Sulawesi Seas		15,000	12,000	20,000	15,000	20,000
	Sub-activity 1.2 Study on the stock structure of tuna in Sulu and Sulawesi Seas.					20,409	7,000
<b>Activity 2:</b> Technical consultation and discussion to plan and prepare offshore fisheries resources research survey in Southeast Asia Waters by utilization of M.V. SEAFDEC 2 or other national research vessel	Sub-activity 2.1 Technical consultation and discussion to plan and prepare offshore fisheries resources research survey in Southeast Asia Waters by utilization of M.V. SEAFDEC 2 or other national research vessel				2,000	3,000	1,200
	Sub-activity 2.2 Marine fisheries resources research survey in the Gulf of Thailand					300,000	
<b>Activity 3:</b> Technical Support to SEAFDEC staff (s) for participating in the cruise survey and the meetings /workshop/ symposium	Sub-activity 3.1 Technical Support of SEAFDEC staff (s) to the cruise survey and the meetings/ workshop/symposium	4,000	4,000	5,000	5,000	5,000	2,240
<b>Activity 4:</b> Improvement Program of the Fish Handling at Sea	Sub-activity 4.1 Organize the Regional activities (Training/Workshop/ Meeting) on the improvement of the fish handling at sea	45,900	15,900	16,000	15,000	18,595	15,000
	Sub-activity 4.2 Regional activities (Training/ Workshop /Meeting) on the improvement of the fish handling at sea				2,000	30,000	

<b>Activity 5:</b> Modification of the offshore sampling gears and technical project publications	Sub-activity 5.1 Modified semi-pelagic and mid-water trawl net for small pelagic fisheries research resources survey	4,000	4,000	5,000	4,000	20,000	0
	Sub-activity 5.2 Set of technical documents of Joint Program on Tuna Research in Sulu and Sulawesi Seas/Project publications					2,500	1,500
.....	Sub-Total Budget	53,900	38,900	38,000	48,000	414,504	46,940

## PART II: ACHIEVEMENT OF 2019 PROJECT IMPLEMENTATION

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

Project has objective to implement the Joint Research Program for Tuna Research Survey in Sulu-Sulawesi Sea by technical support to SEAFDEC Member Countries by collaboratively conduct the research activities on tuna stock assessment in Sulu and Sulawesi Seas based on the sequence of the activities planned/adjusted by the working groups as agreed at the Sulu and Sulawesi seas meeting in 2014. In year 2019, training course on stock assessment by using ASFIC Model has provide to Participating Countries of the project. Stock structure by using skipjack otolith has been introduce to IMP- Countries. At this stage, Indonesia is conducting the skipjack Otolith sample collection.

Project also supported to Department of Fisheries Malaysia to develop the cruise plan of M.V. SEAFDEC 2 on the sea trial of mid-water trawl in Sarawak Waters, Malaysia. The sea trial operation was conducted from 5 to 29 September 2019 and support 15 researchers of DOF Malaysia to join the cruise. Project support the technical meeting to evaluation of the Collaborative Research Survey on Marine Fisheries and Marine Environment in the Gulf of Thailand and ways forward on the human resource development on the fisheries resources survey in the Gulf of Thailand, *i.e.* Cambodia, Thailand and Viet Nam. In addition, SEAFDEC/TD invited Japanese resource person (Dr. Yoshinobu Konishi) to visit TD for improve fish larvae identification at SEAFDEC/ TD. The identification guidebook of the Scombrid fishes and their larvae in the Southeast Asian Region was drafted and agree to develop with the supporting Thai researchers.

In parallel with the promotion on sustainable resources utilization, project has supported the responsible practices on fish handling technology at sea since 2013. The Regional Training Course on Fish Handling Techniques Applicable to Various Fishing Operations in Southeast Asia organized by Training Department of SEAFDEC, at Training Department. Project supported SEAFDEC researchers presented project result in two international conferences. Mid-water trawl and automatic squid jigging was modified from the original to support the sea trial of mid-water trawl in Sarawak Waters, Malaysia.

### 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 1:</b> Technical meetings on the results of the tuna fisheries resources survey in Sulu and Sulawesi Seas	Training	6	2		20,000
<b>Activity 2:</b> Technical consultation and discussion to plan and prepare offshore fisheries resources research survey in Southeast Asia Waters by utilization of M.V. SEAFDEC 2 or other national research vessel	Research	15	5		1,200
<b>Activity 3:</b> Technical Support to SEAFDEC staff (s) for participating in the cruise survey and the meetings /workshop/ symposium	Research	5	2		6,000
<b>Activity 4:</b> Regional training course on fish handling Techniques Applicable to Various Fishing Operations in Southeast Asia	Training	10	3		15,000
<b>Activity 5:</b> Modification of the offshore sampling gears and technical project publications	Research			100	5,000

*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 outcome/output	Achievements
<b>Activity 1</b>		
Sub-activity 1.1 Technical meetings on the results of the tuna fisheries resources survey in Sulu and Sulawesi Seas	Report on the training workshop on Tuna Stock Assessment for YFT, BET and SKJ resources in SSSs by using GLM CPUE standardization, ASPIC, and Kobe Plot to update stock status of tuna in SSSs.	1) Improve human resources capacity on Tuna Stock Assessment for YFT, BET and SKJ resources in SSSs by using GLM CPUE standardization, ASPIC, and Kobe Plot to update stock status of tuna in SSSs for Philippines (Planning in December 2019). 2) Improve human resources capacity on Tuna Stock Risk Assessment for Yellowfin Tuna, Bigeye Tuna and Skipjack Tuna Resources in Sulu and Sulawesi Seas (SSSs).
Sub-activity 1.2 Study on the stock structure of tuna in Sulu and Sulawesi Seas.	Preliminary study on the stock structure of tuna in SEA, Skipjack	Improve human resources capacity on skipjack otolith sampling of Indonesia and Malaysia and Otolith sample collection in Indonesia.

	tuna stock structure study by using otolith will be implemented at pilot site in Indonesia, Malaysia, and Philippines (SSSs).	
<b>Activity 2</b>		
Technical consultation and discussion to plan and prepare offshore fisheries resources research survey in Southeast Asia Waters by utilization of M.V. SEAFDEC2 or other national research vessel	M.V. SEAFDEC 2 support SEAFDEC Member Countries on the Research Survey on Marine Fisheries and Marine Environment	<ol style="list-style-type: none"> <li>1) Agree cruise plan M.V. SEAFDEC 2 of the sea trial of mid-water trawl in Sarawak Waters, Malaysia from 5-29 September 2019.</li> <li>2) M.V. SEAFDEC 2 complete sea trial of mid-water trawl using M.V. SEAFDEC 2 in Sarawak Waters, Malaysia from 5-29 September 2019</li> <li>3) Evaluation of the Collaborative Research Survey on Marine Fisheries and Marine Environment in the Gulf of Thailand and ways forward</li> </ol>
<b>Activity 3</b>		
Japanese resource person (Dr. Yoshinobu Konishi) one-month advisory visit to improve fish larvae identification at SEAFDEC/TD	Regional expert supported research study on the larvae identification in Southeast Asia	<ol style="list-style-type: none"> <li>1) Report on the Consultation Workshop on the Preparation of Guidebook for Identification Scombrid; Adult and Larvae in Southeast Asia</li> <li>2) Draft of the identification guidebook of the Scombrid fishes and their larvae in the Southeast Asian Region</li> </ol>
<b>Activity 4</b>		
Regional training course on fish handling Techniques Applicable to Various Fishing Operations in Southeast Asia	Participants expected to enhance knowledge and practical skills on reduction of post-harvest losses and improve awareness of hygiene and practice of fish handling onboard fishing fleet	<ol style="list-style-type: none"> <li>1) Participants enhance knowledge and practical skills on reduction of post-harvest losses</li> <li>2) Strategies/ways forward to improve fish handling in assigned coastal and offshore fisheries cases in Southeast Asia</li> </ol>
<b>Activity 5</b>		
Sub-activity 5.1 Technical project publications	Article in the Proceeding of International Conference on Fisheries Engineer	SEAFDEC staff presented the preliminary result on marine debris survey in collaborative research survey on marine fisheries and marine environment in the Gulf of Thailand in the International Conference on Fisheries Engineer at Nagasaki University Japan
Sub-activity 5.2 Modification of the offshore sampling gears	Mid-water trawl and accessories	Modify mid-water trawl net and accessories for the sea trial of mid-water trawl using M.V. SEAFDEC 2 in Sarawak Waters, Malaysia from 5-29 September



		2019
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**4. List of Completed Publications and Others (e.g. technical report, VDO, presentation file, etc.):**

<b>List of completed publications for the year 2019</b>	<b>Type of media</b>	<b>Attached e-file</b>
1. Report on the training course on Risk Assessment to improve tuna stock for yellowfin tuna, bigeye tuna and skipjack tuna resources in Sulu and Sulawesi Seas (SSSs).	Hard copy	
2. Report on the Consultation Meeting on the Utilization of the M.V. SEAFDEC 2 for the Sea Trial of Mid-water Trawl Using M.V. SEAFDEC 2 in Sarawak Waters, Malaysia	Hard copy	
3. Report on the Collaborative Research Survey on Marine Fisheries and Marine Environment in the Gulf of Thailand in the proceeding International Conference on Fisheries Engineer	Hard copy and Presentation	
4. Report on the Consultation Workshop on the Preparation of Guidebook for Identification Scombrid; Adult and Larvae in Southeast Asia	Hard Copy	
5. Article in Fish Vol. 17 No. 2 for the People Sustained Utilization of SEAFDEC Vessels through Collaborative Research Surveys: Marine Resources Survey of the Gulf of Thailand using the M.V. SEAFDEC 2	Hard copy	
6. Training report the Regional training course on fish handling Techniques Applicable to Various Fishing Operations in Southeast Asia (4-8 November 2019)	Hard copy	
7. Abstract entitle Relationship on the Characteristics of Trawl Net, Otter board and Trawler in Thailand in proceeding of the ICES-FAO Working Group on Fishing Technology and Fish Behavior (WGFTFB) 2019	Hard copy	
8. Article entitle Preliminary Result on Marine Debris Survey in Collaborative Research Survey on Marine Fisheries and Marine Environment in the Gulf of Thailand in the International in the Proceeding of International Conference on Fisheries Engineer (ICFE) 2019	Hard copy	

**5. Evaluation from Participants of Member Countries for WS and Training Course (if available):**

<b>Planned activity</b>	<b>Evaluation/ Views from Participants</b>
<b>Activity 1</b>	Malaysia and Indonesia appreciate SEAFDEC on the organizing the resource persons support to the training course on Risk Assessment to improve tuna stock for yellowfin tuna, bigeye tuna and skipjack tuna resources in Sulu and Sulawesi Seas (SSSs).
<b>Activity 2</b>	Participant from 3 Member Countries i.e. Cambodia, Thailand and Viet Nam identified the issues, constraints and needs in the evaluation meeting of Marine fisheries resource and Marine environment in the Gulf of Thailand. All participating countries requested to SEAFDEC provide more technical support to their staffs as well as allocate funding to the survey in the future.

	Malaysia appreciated SEAFDEC to support the Sea Trial of Mid-water Trawl Using M.V. SEAFDEC 2 in Sarawak Waters, Malaysia.
<b>Activity 3</b>	Regional larvae expert agreed to draft of the identification guidebook of the Scombrid fishes and their larvae in the Southeast Asian Region. In addition, participants from Department of Fisheries Thailand has been advised by Dr. Yoshinobo Konishi on the larvae identification of the samples collected in the Gulf of Thailand.
<b>Activity 4</b>	Due to the training program plans to conduct during 4-8 November 2019, Evaluation/ Views from Participants can not described during develop the project document.
<b>Activity 5</b>	Organizer of the ICES-FAO WGFTFB 2019 and International Conference on Fisheries Engineer 2019 extended appreciate to SEAFDEC on the participation of SEAFDEC researchers in both conferences.

## 6. Major impacts/issues:

Tuna is significantly important not only import-exports value, but also domestic consumptions in a number of member countries of SEAFDEC. Similar initiatives on tuna or other pelagic species which the stock is sharing among the countries are needed in the future for strengthening cooperation among the countries concerned as well as to build the capacity of human resources for assessment of status of such important species and stock structure in Southeast Asia Region.

In order to support SEAFDEC Member Countries, SEAFDEC should organize regional technical meeting to improve the collaborative survey on marine fisheries resources and marine environment. The overall objectives of regional technical meeting are sharing information on marine fisheries resources and marine environmental situation in Southeast Asia (ii) Increasing number of experience researchers on marine fisheries resources and marine environment,(iii) Strengthen coordination and network of fisheries and oceanography scientist/researcher in Southeast Asia, and (iv) Maximizing the efficiencies and benefit of the SEAFDEC research vessel, research equipment to support on marine fisheries resources and marine environment survey of SEAFDEC Member Countries. Beside of funding constraint, MCs has trouble with human resources capacity to analyze data to support fisheries policy.

Regional training course on fish handling technique, applicable to various fishing operation in Southeast Asia has a language barrier among the participants. Some participants requested for more practical session and field trips (few vessels). They however evaluated that the training functioned well on facilitation, resource persons, coordination among course, lectures & practices, training documents and methods, teamwork. They also evaluated that training provided appropriate knowledge for their works and countries. Obviously that HRD on the fish handling technique is needed for SEAFDEC Member Countries. The activities should extend to the next phase of Japanese Trust Fund Project in 2020-2025.

In order to follow up the global fisheries status and trend, SEAFDEC will send researchers to participate the international conference and symposium to present the SEAFDEC activities and research studies. This will support the project planning to deal with fisheries status and trend for Southeast Asia region.

## PART III: ACHIEVEMENTS IN OVERALL PROJECT DURATION

### 1. Abstract of Achievements in the Overall Project Duration:

Project support implementation of Joint Research Program for Tuna Research Survey in Sulu-Sulawesi Sea by technical support to SEAFDEC Member Countries locate around Sulu and Sulawesi Seas, *i.e.*

Indonesia, Malaysia and Philippines on the research study in Stock assessments of yellowfin tuna (*Thunnus albacares*), bigeye tuna (*Thunnus obesus*) and skipjack tuna (*Katsuwonus pelamis*) in Sulu and Sulawesi Seas. Project also encourages and facilitates to SEAFDEC Member Countries to conduct the collaborative implements the marine fisheries resources and marine environment research survey by utilization of Training and Research Vessel, M.V. SEAFDEC 2. Six (6) cruise of M.V. SEAFDEC 2 had been conducted since year 2014. SEAFDEC in collaborate with National Fisheries University of Japan provided human resource capacity building on marine fisheries resources and marine environment research survey to Fisheries Administration of Cambodia during 2014-2016.

Project provides technical support to develop human resources development of SEAFDEC Member Countries to improve fish handling onboard through the training program on fish handling techniques applicable to various fishing operations in Southeast Asia. 172 Participants understand the importance of hygienic, cleanliness and important key factors contributing to reduction of post-harvest losses onboard. Project distributes result of the study on tuna abundance in Sulu and Sulawesi Seas and cruise survey by M.V. SEAFDEC 2 to all members. Project supported SEAFDEC researchers presented project result in the international conferences.

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

Activity	Description
<p><b>Activity 1:</b> Technical meetings on the results of the tuna fisheries resources survey in Sulu and Sulawesi Seas</p>	<p>Project support implementation of Joint Research Program for Tuna Research Survey in Sulu-Sulawesi Sea by technical support to SEAFDEC Member Countries locate around Sulu and Sulawesi Seas, <i>i.e.</i> Indonesia, Malaysia and Philippines on the research study in Stock assessments of yellowfin tuna (<i>Thunnus albacares</i>), bigeye tuna (<i>Thunnus obesus</i>) and skipjack tuna (<i>Katsuwonus pelamis</i>) in Sulu and Sulawesi Seas. Technical meetings on the results of tuna fisheries resources survey in Sulu and Sulawesi seas. As planned through a series of the technical meetings on tuna research in Sulu and Sulawesi Seas, preliminary results of M.V. SEAFDEC 2 cruise survey on tuna resources in Sulu and Sulawesi Seas</p>
<p><b>Activity 2:</b> Technical consultation and discussion to plan and prepare offshore fisheries resources research survey in Southeast Asia Waters by utilization of M.V. SEAFDEC 2 or other national research vessel</p>	<p>Supporting SEAFDEC technical staffs to conduct the consultation visit on planning of offshore fisheries resources research survey in Southeast Asia Waters by using of M.V. SEAFDEC 2 or other national research vessel.</p>
<p><b>Activity 3:</b> Technical Support to SEAFDEC staff(s) for participates in the cruise survey and the meetings/ workshop/ symposium</p>	<p>Supporting technical staff(s) of SEAFDEC/TD participate the cruise survey and the meetings/workshop/symposium to promote result of project Offshore Fisheries Resources Exploration in Southeast Asia. In addition, activity has also aimed to facilitate invited expert of SEAFDEC Member Countries technically visit to SEAFDEC for technical collaboration.</p>
<p><b>Activity 4:</b> Organize the Regional activities (Training/ Workshop/Meeting) on the improvement of the fish</p>	<p>National or regional activities (Training/Workshop/Meeting) on the improvement of the fish handling at sea aim to identify problem of the post-harvest fish handling both onshore and onboard fishing vessel of SEAFDEC Member Countries and seek for the recommendation on future improvement of post-harvest fish handling both onshore and</p>

handling at sea and study on the assessment of post-harvest loss in Southeast Asia	onboard fishing vessel. Activities include research study to assess post-harvest fish loss in Southeast Asia Region
<b>Activity 5:</b> Modification of the offshore sampling gears and technical project publications	<p>In order to strengthen research survey on offshore fisheries resources, in particular, the tuna resource research survey in Sulu and Sulawesi Seas, continuation on modification of sampling gear used with M.V. SEAFDEC 2 cruise survey will be carried out. A number of sampling gears will be redesigned.</p> <p>In order to promote value addition marine fisheries products in Southeast Asian Region, promotional materials including with package(s) of technical handbooks and training reports on improvement of post-harvest fish handling will be disseminated through the project website.</p> <p>Project also conduct the compilation and revision of the technical handbook or guideline of SOP on sampling gears and survey methodology for offshore fisheries resources exploration. These publications will be disseminated both by documents and website.</p>

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

List of Activities	Achievements and Outcomes/Outputs of Activities
<b>Activity 1:</b> Technical meetings on the results of the tuna fisheries resources survey in Sulu and Sulawesi Seas	Technical support to Member Countries around Sulu and Sulawesi Seas, i.e. Indonesia, Malaysia and Philippines on the research study in Stock assessments of yellowfin tuna ( <i>Thunnus albacares</i> ), bigeye tuna ( <i>Thunnus obesus</i> ) and skipjack tuna ( <i>Katsuwonus pelamis</i> ) in Sulu and Sulawesi Seas including Standard Operational Procedure (SOP) to conduct data collection and assessing the status of tuna resources in region or Sulu and Sulawesi sub-region in Southeast Asia, report on the stock assessments of yellowfin tuna ( <i>Thunnus albacares</i> ), bigeye tuna ( <i>Thunnu sobesus</i> ) and skipjack tuna ( <i>Katsuwonus pelamis</i> ) in Sulu and Sulawesi Seas by using Kobe plot, ASPIC Model and risk assessment. More than 30 researchers of Indonesia, Malaysia, and Philippines involve in the project.
<b>Activity 2:</b> Technical consultation and discussion to plan and prepare offshore fisheries resources research survey in Southeast Asia Waters by utilization of M.V. SEAFDEC 2 or other national research vessel	SEAFDEC provide technical assistance to SEAFDEC MCs to develop the cruise plans of marine fisheries resources research survey in Southeast Asia by using of M.V. SEAFDEC 2 or other national research vessel, i.e. The first Joint Research Program on Tuna Resources Survey in the Sulu and Sulawesi Seas within the EEZ of Indonesia, Malaysia and Philippines. (2014), the second Joint Research Program on Tuna Resources Survey in the Sulu and Sulawesi Seas within the EEZ of Indonesia, Malaysia and Philippines. (2015), Demersal Fisheries Resources Survey Using M.V. SEAFDEC 2 in the EEZ Waters of the East Coast of Peninsular Malaysia (2016), Survey cruise of M.V. SEAFDEC 2 on small pelagic fishery resources assessment in Viet Nam Marine Waters (2017), Collaborative Research Survey on Marine Fisheries and Marine Environment in the Gulf of Thailand (2018) and Sea Trial of Mid-water Trawl Using M.V. SEAFDEC 2 in Sarawak Waters, Malaysia (2019). There are 169 researchers involve with the cruise survey since year 2015.
<b>Activity 3:</b>	SEAFDEC in collaborate with National Fisheries University of Japan

<p>Technical Support to SEAFDEC staff(s) for participates in the cruise survey and the meetings/ workshop/ symposium</p>	<p>provide human resource development to Fisheries Administrative researcher of Cambodia on the marine fisheries resources and marine environment research survey by utilization of Training and Research Vessel Koyo Maru, in year 2014, 2015 and 2016. There were sixteen (16) FiA researchers and eight (8) SEAFDEC staffs joined cruise survey during year 2014 - 2016. Project also supported the human resource development of SEAFDEC researcher to join the cruise survey in the UM-17-09, project “Integrating Study Programme of the Marine Ecosystem of the Indian Ocean Sector of the Southern Ocean” (31 December 2017 to 23 January 2018) by TRV Umitaka Maru.</p> <p>SEAFDEC support FiA Cambodia researchers enhance their skill on fish larvae identification in year 2017. SEAFDEC Department of Fisheries, Thailand in the national training course on the utilization of ASPIC Software and Kobe Plot for Assessing Status of Fisheries Resources organize by Department of Fisheries Thailand in and support the national fishing technology training course organized in Department of Fisheries Malaysia in 2018.</p>
<p><b>Activity 4:</b> Organize the Regional activities (Training/ Workshop/Meeting) on the improvement of the fish handling at sea and study on the assessment of post-harvest loss in Southeast Asia</p>	<p>Participants expected to enhance knowledge and practical skills on reduction of post-harvest losses which will help reinforce extension and promotion activities in their respective countries. Since year 2015, SEAFDEC improve human resources on fish handling at sea to reduce post-harvest loss in Southeast Asia, total number of trainees in the Regional activities (Training/ Workshop/Meeting) on the improvement of the fish handling at sea and study on the assessment of post-harvest loss in Southeast Asia 172 fisheries officers.</p>
<p><b>Activity 5:</b> Modification of the offshore sampling gears and technical project publications</p>	<p>There are sixteen (16) publications distributed to the region. List of publication presented in topic 5.</p> <p>Various fishing gear <i>e.g.</i> demersal trawl, mid-water trawl, tuna longline, and automatic squid jigging has been modified in order to provide technical support to SEAFDEC MCs on the national fisheries resources research survey in their countries.</p>

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

Tuna is significantly important not only import-exports value, but also domestic consumptions in a number of member countries of SEAFDEC. Similar initiatives on tuna or other pelagic species which the stock is sharing among the countries are needed in the future for strengthening cooperation among the countries concerned as well as to build the capacity of human resources for assessment of status of such important species and stock structure in Southeast Asia Region. Project provide technical assistant to improve human resourced development on stock assessment of highly migratory tunas species in Sulu Sulawesi Sea. Stock assessment model provide for participating countries i.e. Indonesia, Malaysia and Philippines are the same as using in Regional Fisheries Management Organization (RFMO) e.g. IOTC, WCPFC, that countries can use to study on tunas in their national waters.

To support offshore fisheries resources research exploration, SEAFDEC provide technical assistant both planning process and budget estimation of cruise survey and support Research Vessels i.e. M.V. SEAFDEC 2. Countries obtained significant data to evaluate monitor fisheries resources status for

policy development. However, SEAFDEC has not yet supported SEAFDEC Member Countries to organize regional technical meeting, to improve the collaborative survey on marine fisheries resources and marine environment. The overall objectives of regional technical meeting are sharing information on marine fisheries resources and marine environmental situation in Southeast Asia (ii) Increasing number of experience researchers on marine fisheries resources and marine environment,(iii) Strengthen coordination and network of fisheries and oceanography scientist/researcher in Southeast Asia, and (iv) Maximizing the efficiencies and benefit of the SEAFDEC research vessel, research equipment to support on marine fisheries resources and marine environment survey of SEAFDEC Member Countries. Beside of funding constraint, MCs has trouble with human resources capacity to analyze data to support fisheries policy.

Regional training course on fish handling technique, applicable to various fishing operation in Southeast Asia has a language barrier among the participants. Some participants requested for more practical session and field trips (few vessels). They however evaluated that the training functioned well on facilitation, resource persons, coordination among course, lectures & practices, training documents and methods, teamwork. They also evaluated that training provided appropriate knowledge for their works and countries. Obviously that HRD on the fish handling technique is needed for SEAFDEC Member Countries. The activities should extend to the next phase of Japanese Trust Fund Project in 2020-2025.

In order to follow up the global fisheries status and trend, SEAFDEC will send researchers to participate the international conference and symposium to present the SEAFDEC activities and research studies. This will support the project planning to deal with fisheries status and trend for Southeast Asia region.

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

1. Report (internal used only) Stock assessments of yellowfin tuna (*Thunnus albacares*), bigeye tuna (*Thunnus obesus*) and skipjack tuna (*Katsuwonus pelamis*) in Sulu and Sulawesi Seas (Hard copy)
2. Scientific Report entitles Stock Assessments of yellowfin tuna (*Thunnus albacares*), bigeye tuna (*Thunnu sobesus*) and skipjack tuna (*Katsuwonus pelamis*) in Sulu and Sulawesi Seas by ASPIC Model (Hard copy)
3. Technical Report on the Distribution of Fish aggregating devices (FADs) around SSSs (Hard copy)
4. Survey Report on Fisheries Resources Abundance around SSSs by Using Hydroacoustic Equipment (Hard copy)
5. SOPs for assessing the status of tuna resources in region or Sulu and Sulawesi sub-region in Southeast Asia (Hard copy)
6. Report on the training course raining workshop on Tuna Stock Assessment for YFT, BET and SKJ resources in SSSs by using GLM CPUE standardization, ASPIC, and Kobe Plot to update stock status of tuna in SSSs. (Hard copy)
7. Survey Proposal on the Collaborative Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand (Hard Copy)
8. Summary Report on the Technical Meeting on the Plan for the Survey Cruise of M.V. SEAFDEC 2 on Marine fisheries resource and Marine environment in the Gulf of Thailand (Hard Copy)
9. Summary Report on the Technical Meeting on the Collaborative Research Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand (Viet Nam Waters) (Hard Copy)
10. Summary Report on the Technical Meeting on the Collaborative Research Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand (Cambodia Waters) (Hard Copy)
11. Summary Report on the Technical Meeting on the Collaborative Research Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand (Thailand Waters) (Hard Copy)

12. Draft Standard Operation Procedure on the Collaborative Research Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand (Cambodia, Thailand, and Viet Nam Waters) (Hard Copy)
  13. Cruise Report on the Collaborative Research Survey on Marine Fisheries Resources and Marine Environment in the Gulf of Thailand (Cambodia, Thailand, and Viet Nam Waters) (Hard Copy)
  14. Training Report of the On-site Training Course on Proper Fish Handling Techniques Applicable to local fishing vessels (Hard Copy)
  15. Abstract entitle Relationship on the Characteristics of Trawl Net, Otter board and Trawler in Thailand in proceeding of the ICES-FAO Working Group on Fishing Technology and Fish Behavior (WGFTFB) 2019
  16. Article in Fish Vol. 17 No. 2 for the People Sustained Utilization of SEAFDEC Vessels through Collaborative Research Surveys: Marine Resources Survey of the Gulf of Thailand using the M.V. SEAFDEC 2
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