



**PROJECT DOCUMENT  
 ACHIEVEMENTS FOR YEAR 2019  
 AND  
 PROPOSED ACTIVITY FOR YEAR 2020**

				<b>Project id:</b> 201301006
<b>Program Categories:</b>	ASEAN-SEAFDEC ASSP and FCG Mechanism			
<b>Project Title:</b>	Fisheries Resource Survey & Operational Plan for M.V. SEAFDEC 2			
<b>Program Strategy No.</b>	VI	<b>Total Duration:</b>	2004 ~	
<b>Lead Department:</b>	Training Department	<b>Lead Country:</b>	None	
<b>Donor/Sponsor:</b>	Host Countries of the Survey	<b>Total Donor Budget:</b>	None	
<b>Project Partner:</b>	None	<b>Budget for 2019:</b>	None	
<b>Project leader:</b>	Isara Chanrakhij	<b>Involved Country</b>	SEAFDEC Member Counties	

**PART I: OVERALL PROJECT DESCRIPTION**

**1. Brief Project Description (300 words max):**

Since the establishment of Southeast Asian Fisheries Development Center (SEAFDEC) in 1968, the technical supporting to SEAFDEC Member Countries (MCs) on the monitoring of fisheries resource, marine environmental situation and human resource development by SEAFDEC's research vessels has been on the major mandates of SEAFDEC. Since year 2004, M.V. SEAFDEC 2 has been granted by Government of Japan to support SEAFDEC MCs on fisheries resources and marine environmental survey in order to fulfill the needs of the SEAFDEC MCs. The major outputs from the survey is cruise reports, technical documents on fisheries resource stock status marine biodiversity, and other specific requirements, e.g. oceanography and marine environment, and etc. SEAFDEC has expected that the results from the survey could facilitate the establishment and implementation of comprehensive policy for sustainable management and development of marine capture fisheries both national, sub-regional and regional. The major output is included with the adequate numbers of researcher on various field, *i.e.* fisheries resources and marine environmental survey, oceanographers, fisheries biologist, fishing gear technologist, navigator and marine engineer, who has skill and experience to support the shipboard survey.

In order to achieve the expected outputs as mentioned above, SEAFDEC Training Department (TD) works in close collaboration with the SEAFDEC Member Countries and potential partners at national, sub-regional, and regional levels has supported MCs on fisheries resources and marine environmental survey. M.V. SEAFDEC 2 as major research vessel has carried out sixty (60) cruises with four (4) major components: (1) Marine fisheries resources research survey; (2) Marine environmental oceanographic research survey; (3) Onboard navigation and marine engineering training; and (4) Sea trial on fishing operation, oceanographic instruments, and fishing vessel.

In year 2019, total number of service days by M.V. SEAFDEC 2 are 57 days with 5 cruises in Thai waters (32 days) and Malaysia waters (25 days). The Marine Environment and Oceanographic Research Survey (M.V. SEAFDEC 2 No. 61-4/2019) is conducted of the environmental research survey on marine debris in the Gulf of Thailand. The cruises of human resource development are 1) Cruise No.58-2/2019 is sea trial of mid-water trawl and automatic squid jigging preparation to support Department of Fisheries Malaysia, 2) Cruise No.59-3/2019 is shipboard training for observer onboard training program of Department of Fisheries Thailand, and 3) M.V. SEAFDEC 2 Cruise No.60-4/2019 is the sea trial of mid-water trawl in Sarawak Waters, Malaysia (5 to 29 September 2019). In

addition, M.V. SEAFDEC 2 Cruise No.57-1/2019 (19 March 2019; 1 days) has is sea after installation of the modern navigation equipment, parts of engines and fishing accessories have been installed onboard M.V. SEAFDEC 2.

## **2. Background and Justification**

In 2002, the Government of Japan approved the construction of a new fishery research and training vessel namely “M.V. SEAFDEC 2” along with procurement of the requisite fishing gear, fishing machinery, and survey equipment with the main purposes to conduct fishery resource and oceanographic research surveys and shipboard training on such topic in ASEAN Countries,. Subsequently, the construction of a research vessel, M.V. SEAFDEC 2, was completed in 2003. Since 2004, research survey on fisheries resource exploration and sea trial on sampling gears, fishery oceanography, and other activities related to marine capture fisheries were conducted by M.V. SEAFDEC 2 in collaboration with SEAFDEC Member Countries. In a broader sense, the achievement of M.V. SEAFDEC 2 includes strengthen technical cooperation for effective fisheries and environmental management in the ASEAN region through the enhancement of research capability. Due to increased operational cost for using M.V. SEAFDEC 2 that mainly caused by increased fuel price, the 40<sup>th</sup> Meeting of SEAFDEC Council (2009) agreed that the country that request to use M.V. SEAFDEC 2 should be responsible for the cost incurred by the vessel. Since 2010, the modified cost-sharing policy was therefore applied that fuel consumption of the vessel for the entire duration of the research/survey including cursing to and back to the requesting country will be responsible by the requested country(s).

At the 45<sup>th</sup> Meeting of the Council of SEAFDEC in year 2013, SEAFDEC/TD proposed some revisions of the Guidelines on the Cost Sharing Policy for operation of the M.V. SEAFDEC 2. The results was that sharing of data collected from the cruise survey using M.V. SEAFDEC 2 should be finalized at the planning meeting before the cruise survey between the requesting country and SEAFDEC. Such basic data will be kept confidential and to be used only for the SEAFDEC regional database and for future regional analysis.

In year 2018, the 41<sup>th</sup> Program Committee Meeting of SEAFDEC has adopted 2 major cruises of M.V. SEAFDEC, 2 i.e. 1) Small Pelagic Fishery Resources Assessment in Viet Nam Marine Waters and 2) 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. Actual days, however occurred in year 2019 is different from the plan in the PCM 41<sup>st</sup>. Due to budget constraint, Directorate of Fisheries, Viet Nam needed to postpone the cruise in 2019 to 2020. Government of Thailand has submitted the request in mid of 2019 to utilize M.V. SEAFDEC 2 for the shipboard training on Observer onboard Program. With the international concern on the marine debris and plastic in the ocean, SEAFDEC Training Department supported by Japanese Government through Japanese Trust Fund plans to carried out a shipboard survey in December 2019. Expected total number of services days of M.V. SEAFDEC 2 in year 2019 are 60 days.

SEAFDEC Training Department has conducted the capacity improvement of M.V. SEAFDEC 2 after her service at SEAFDEC for 14 years. Modern navigation equipment, parts of engines and fishing accessories have been installed onboard M.V. SEAFDEC 2. In this connection, SEAFDEC engineers was granted for the training in Japan. They gained their knowledge on modern instruments and engine overall maintenance. In year 2020 SEAFDEC will continue improve the vessel capacity in fishing and oceanographic instruments and continue support MCs on 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 SEAFDEC’s Training and Research Vessels.

### 3. Gender Sensitivity of the Project

Shipboard activities by using M.V. SEAFDEC 2 are available for female and male researcher. However, numbers of female researcher are less than male researcher regarding to the number of bathroom and toilet arrangement onboard. Generally, the quota for female researcher is 4 persons by limited by 1 bedroom with 4 bunkers.

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

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

Objective	Outcomes	Outputs	Activities
<b>Objective 1:</b> Assist Member Countries to conduct fisheries research resources survey	<b>Outcome 1:</b> National fisheries management by using the update reference data and information from the Marine Fisheries Resources and Marine Environment survey	<b>Output 1:</b> A set of scientific data <i>i.e.</i> fisheries resource, marine environmental and oceanography data collected from the cruise survey	<b>Activity 1:</b> M.V. SEAFDEC 2 No. 61-4/2019 The Environmental Research Survey on Marine Debris in the Gulf of Thailand (December 2019; 25 days)
<b>Objective 2:</b> Assist Member Countries to build human resources capacity by using M.V. SEAFDEC 2	<b>Outcome 2:</b> National fisheries resources and marine environmental survey conducted by SEAFDEC MCs	<b>Output 2.1</b> Competent researcher in the marine fisheries resources research survey	<b>Activity 2.1:</b> 1. M.V. SEAFDEC 2 Cruise No.58-2/2019 (29-31 May 2019; 3 days): Sea Trial of Mid-water Trawl and Automatic Squid Jigging. 2. M.V. SEAFDEC 2 Cruise No.59-3/2019 (26 - 30 June 2019; 5 days) is Shipboard Training for Observer onboard Training Program 3. M.V. SEAFDEC 2 Cruise No.60-4/2019 is the sea trial of mid-water trawl by using M.V. SEAFDEC 2 in Sarawak Waters, Malaysia (5 to 29 September 2019; 25 days).
		Competent of ship staffs of SEAFDEC Training Department (Navigators and Engineers)	<b>Activity 2.2:</b> 1. Program for Project for Construction of a fisheries research and Training Vessel 2. M.V. SEAFDEC 2 Cruise No.57-1/2019 (19 March 2019; 1 days) follow up cooperation on the project for construction of fisheries research and training vessel

#### 4.2 Overall Scope/Description of Project

Activity	Description
<b>Activity 1</b> Marine Environment and Oceanographic Research Survey	Southeast Asia Region has been accused as major source of marine debris and marine plastic polluter. To

<p>M.V. SEAFDEC 2 No. 61-4/2019 The Environmental Research Survey on Marine Debris in the Gulf of Thailand (December 2019)</p>	<p>investigate source of marine debris in Southeast Asia in particular Gulf of Thailand, SEAFDEC in collaboration with relevant partners, e.g. Tokyo University of Marine Science and Fisheries, Chulalongkorn University</p> <p>Department of Coastal Marine and Resources Thailand, to conduct Training and Research Survey on Marine Debris in the Gulf of Thailand in the Gulf of Thailand by using Research Vessel, M.V. SEAFDEC 2. The major envisage objectives are; 1) Developing standard procedure on the marine debris observation and information collection to fulfill need of baseline information on marine debris includes investigate sources of these marine debris, (ii) Increasing number of experience researchers on marine debris and related subject e.g. mesoplastic and microplastic, (iii) Strengthen network of oceanography scientist/researcher in Southeast Asia, and (iv) Maximizing the efficiencies and benefit of the SEAFDEC research vessel, research equipment to support on environment survey of SEAFDEC Member Countries. Survey area covers the area around the of Thailand EEZ in the Gulf of Thailand.</p>
<p><b>Activity 2</b> Human resources development Sub-activity 2.1 Human resources development through the shipboard survey M.V. SEAFDEC 2</p>	<p>M.V. SEAFDEC 2 Cruise No.58-2/2019 is sea trial of mid-water trawl and automatic squid jigging. The main objective is to prepare the fishing gear and equipment for the Cruise No.60-4/2019 is the sea trial of mid-water trawl by using M.V. SEAFDEC 2 in Sarawak Waters.</p> <p>M.V. SEAFDEC 2 Cruise No.59-3/2019 is shipboard training for observer onboard training program of Department of Fisheries Thailand. The main objectives is support the shipboard training program on observer onboard by operating bottom trawl and pelagic longline fishing.</p> <p>M.V. SEAFDEC 2 Cruise No.60-4/2019 is the sea trial of mid-water trawl by using M.V. SEAFDEC 2 in Sarawak Waters, Malaysia (5 to 29 September 2019). The main objectives are determine the feasibility, acquire knowledge and experience of using mid-water trawl, fishing gear, determine the catch composition of the mid-water trawl fishing gear by M.V. SEAFDEC 2 in Malaysian waters and demonstrate automatic squid jigging machine operation for researchers and staffs of Department of Fisheries Malaysia.</p>
<p>Sub-activity 2.2 Program on the improve Construction of a fisheries research and training Vessel</p>	<p>M.V. SEAFDEC 2 Cruise No.57-1/2019 (19 March 2019; 1 days) has an objective to follow up cooperation on the project for improve of fisheries research and training vessel, M.V. SEAFDEC 2. Modern navigation equipment, parts of engines and fishing accessories have been installed onboard M.V. SEAFDEC 2. In this connection, SEAFDEC engineers were granted for the training in Japan.</p>

### 4.3 Activity, Sub-activity and Proposed Budget for 2013-2019

(Unit: USD)

Activity	Sub-Activity	Y1 2013	Y2 2014	Y3 2015	Y4 2016	Y5 2017	Y6 2018	Y7 2019
Activity 1:	Sub-activity 1.1:	Cost Sharing Policy						
Activity 2:	Sub-activity 2.1:	Cost Sharing Policy						
	Sub-activity 2.2:						Budget support by JICA Japan	
	Sub-Total Budget							

## PART II: ACHIEVEMENTS OF 2019 PROJECT IMPLEMENTATION

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

Total number of service days by M.V. SEAFDEC 2 are 57 days with 5 cruises in Thai waters (32 days) and Malaysia waters (25 days). The major envisage achievements of the Project Implementation are separated into 2 main categories i.e. 1) Marine fisheries resources, marine environment and oceanographic research survey. The survey on the marine debris in Southeast Asia in particular Gulf of Thailand will support the developing standard procedure on the marine debris observation and information collection to fulfill need of baseline information on marine debris includes investigate sources of these marine debris, (ii) Increasing number of experience researchers on marine debris and related subject e.g. mesoplastic and microplastic, (iii) Strengthen network of oceanography scientist/researcher in Southeast Asia. Sea trial of mid-water trawl in Sarawak Waters, Malaysia can support Department of Fisheries Malaysia on the information and reference of operations of the midwater trawl both fish finder equipment, depth detection devices, trawl gear and its operation both net setting including fish searching and depth indicators for monitoring the gear performance. These will support the promotion of midwater fisheries of Malaysia. 2) Human resource development on experience researchers on marine fisheries resources and marine environment of SEAFDEC Member Countries. There are 32 trainees from Thailand and Malaysia participate in the training cruises of M.V. SEAFDEC 2. In addition SEAFDEC expects 20 trainees from Thailand to practices the identification and determining on the source and assess the marine debris in the Gulf of Thailand. Total SEAFDEC staffs acquire experience on the shipboards operation and fisheries and environment survey are 21 SEAFDEC staffs.

### 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> Marine Environment and Oceanographic Research Survey M.V. SEAFDEC 2 No. 61-4/2019 The Environmental Research Survey on Marine Debris in the Gulf of Thailand (December 2019)	<b>I</b>	<b>20(4)</b>	<b>20(1)</b>		
<b>Activity 2</b> Human resources development	<b>II</b>				
Sub-activity 2.1 Human resources development through the shipboard survey M.V. SEAFDEC 2					
1) M.V. SEAFDEC 2 Cruise	-		<b>21(0)</b>		

No.58-2/2019 (29-31 May 2019; 3 days): Sea Trial of Mid-water Trawl and Automatic Squid Jigging.					
2) M.V. SEAFDEC 2 Cruise No.59-3/2019 (26 - 30 June 2019; 5 days) is Shipboard Training for Observer onboard Training Program	<b>17(0)</b>		<b>21(0)</b>		
3) M.V. SEAFDEC 2 Cruise No.60-4/2019 is the sea trial of mid-water trawl by using M.V. SEAFDEC 2 in Sarawak Waters, Malaysia (5 to 29 September 2019; 25 days).	<b>15(0)</b>		<b>21(0)</b>		
Sub-activity 2.2 Program on the improve Construction of a fisheries research and training Vessel M.V. SEAFDEC 2 Cruise No.57-1/2019 (19 March 2019; 1 days)	-		<b>15(0)</b>		

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

Planned activity	Expected outcome/output	Achievements
<b>Activity 1</b> Marine Environment and Oceanographic Research Survey M.V. SEAFDEC 2 No. 61-4/2019 The Environmental Research Survey on Marine Debris in the Gulf of Thailand (December 2019; 23 days)	<ol style="list-style-type: none"> <li>1. Researcher of SEAFDEC MCs get knowledge and experience on the marine debris survey by using research vessel</li> <li>2. Complete sampling survey stations and</li> <li>3. Report on the marine debris observation in the Gulf of Thailand</li> </ol>	The baseline data and present status of marine debris and related subject e.g. mesoplastic and microplastic situation in the Gulf of Thailand will be collected for scientific reference. Researchers of SEAFDEC MCs get knowledge, skill, and experience on marine debris survey of the researchers of SEAFDEC Member Countries in addition, the promoting and developing the marine debris study in Thailand has been strengthened. In this connection, the regional network on the marine debris and related subject e.g. mesoplastic and microplastic scientists in the Gulf of Thailand sub-region.
<b>Activity 2</b> Human resources development		
1. M.V. SEAFDEC 2 Cruise No.58-2/2019 Sea trial of mid-water trawl and automatic squid jigging (29-31 May 2019; 3 days)	The main objective is to prepare the fishing gear and equipment for the	All fishing gear and accessories i.e. mid-water trawl and automatic squid jigging were ready for the sea trial of mid-water trawl by using M.V. SEAFDEC 2 in Sarawak Waters, Malaysia (5 to 29 September 2019).
2. M.V. SEAFDEC 2 Cruise No.59-3/2019 Shipboard Training for Observer onboard Training Program of	The main objective is to provide shipboard training program on observer onboard	Main fishing activities bottom trawl and pelagic longline (for Mackerel) fishing operations were carried out in this cruise. Trainees observed the catch and fill in fishing log and record.

Department of Fisheries Thailand. (26-30 June 2019; 5 days)	by operating bottom trawl and pelagic longline fishing.	
3. M.V. SEAFDEC 2 Cruise No.60-4/2019 is the sea trial of mid-water trawl by using M.V. SEAFDEC 2 in Sarawak Waters, Malaysia (5 to 29 September 2019; 25 days).	The main objectives are determination the feasibility and acquire knowledge and experience of using mid-water trawl and automatic squid jigging machine, as well as catch composition of the mid-water trawl and automatic squid jigging machine operation.	There are total of ten (10) mid-water trawl fishing operations and three (3) automatic fishing demonstrations. Total of fifteen (15) oceanographic survey stations would be conducted during sea trial, after the completion of the mid-water trawl operation.  Due to the severe weather and sea condition M.V. SEAFDEC 2 sheltered at Labuan jetty for 3 days. The operation cannot completely according to the original plan.
Sub-activity 2.2: M.V. SEAFDEC 2 Cruise No.57-1/2019 sea trial of M.V. SEAFDEC 2 in the improvement program of M.V. SEAFDEC 2 (19 March 2019; 1 days)	Competent SEAFDEC navigators and engineers in the improvement of M.V. SEAFDEC 2	1) Navigators of M.V. SEAFDEC 2 understand and be able to operate the new instrument e.g. navigation equipment, communication equipment on board M.V. SEAFDEC2 2) Engineers of M.V. SEAFDEC 2 get knowledge and experience on engine maintenance of main engine and auxiliary engine and deck machineries.

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

List of completed publications for the year 2018	Type of media	Attached e-file
1. Draft cruise report of M.V. SEAFDEC 2 Cruise No.57-1/2019 (19 March 2019)	Hard copy	
2. Draft cruise report of M.V. SEAFDEC 2 Cruise No.58-2/2019 Sea trial of mid-water trawl and automatic squid jigging. (29-31 May 2019)	Hard copy	
3. Draft cruise report of M.V. SEAFDEC 2 Cruise No.59-3/2019 Shipboard Training for Observer onboard Training Program of Department of Fisheries Thailand. (26-30 June 2019)	Hard copy	
4. Draft cruise report of M.V. SEAFDEC 2 Cruise No.60-4/2019 is the sea trial of mid-water trawl by using M.V. SEAFDEC 2 in Sarawak Waters, Malaysia (5 to 29 September 2019).	Hard copy	

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

Planned activity	Evaluation/ Views from Participants
1. M.V. SEAFDEC 2 Cruise No.58-2/2019 Sea trial of mid-water trawl and automatic squid jigging (29-31 May 2019; 3 days)	SEAFDEC researchers understood the mid-water trawl and automatic squid jigging operations and the necessary equipment installation onboard M.V. SEAFDEC 2.

2. M.V. SEAFDEC 2 Cruise No.59-3/2019 Shipboard Training for Observer onboard Training Program of Department of Fisheries Thailand. (26-30 June 2019; 5 days)	All trainees were interested, well cooperated and learned the fishing methods, fish sorting practices, and experienced living onboard. Due to limited fishing ground and fishing time, only few operations can conduct fishing the survey that may not fulfill all experience in the professional fishing however they acquired all knowledge that should be applied in the observer onboard operation in oversea area.
3. M.V. SEAFDEC 2 Cruise No.60-4/2019 is the sea trial of mid-water trawl by using M.V. SEAFDEC 2 in Sarawak Waters, Malaysia (5 to 29 September 2019; 25 days).	Researcher of the Department of Fisheries Malaysia acquire knowledge and experience of using mid-water trawl and automatic squid jigging fishing operations. They understand performance and characteristics of the mid-water trawl, the factors on the successfully in capture pelagic species by using mid-water trawl, as well as the basic required equipment e.g. echo-sounder, scanning sonar. Additionally, experiences and expertise are also considered very important keys to success;
4. M.V. SEAFDEC 2 No. 61-4/2019 The Environmental Research Survey on Marine Debris in the Gulf of Thailand (December 2019; 25 days)	Activity has not yet implemented so that none of evaluation from participants.

## 6. Major Impacts/Issues

The survey has constraint with the weather condition in Sarawak waters. Number of trawl operation and survey days was reduced from the original.

Midwater trawling with depth sensor made operation easy to maneuver the fishing gears. However M.V. SEAFDEC 2 has not yet finished improvement of some scientific and survey equipment *e.g.* Scanmar Trawl-eye®, Depth sensor, and etc., so that efficiency of trawling operation had not fully obtained during the survey.

Big fish school searching could not search during the survey so that catch from mid-water trawling operations are low. In addition, the sea surface temperature during the survey was high that should be one major impact to the occurrence of fish school during the sea trial in Sarawak waters, Malaysia.

## 7. Summary of Project Achievements (for the project of 2 years and over which will be completed by the year 2019, e.g. JTF-6 Phase I)

Project will continue to support SEAFDEC MCs in year 2021. The operation days of M.V. SEAFDEC 2 since year 2004 is 1,604 service days. There are 1,371 days support the national fisheries resources and environment research survey and 234 days support sub-regional fisheries resources and environment research survey.

In year 2019, M.V. SEAFDEC 2 has finished improvement of the navigation instruments, parts of engines and fishing accessories that have been installed onboard M.V. SEAFDEC 2. Scanmar sensors are renews and refurbished. However scientific echo sounder, Simrad EK series has not been installed onboard M.V. SEAFDEC 2 due to high cost. In year 2020, SEAFDEC continues to support Member Countries in 2 main activities *i.e.* 1) Marine fisheries resources, marine environment and oceanographic research survey and 2) Human resource development on experience researchers on marine fisheries resources and marine environment.



## PART III: PROPOSED ACTIVITIES FOR THE YEAR 2020

### 1. Project Summary in 2020

In 2020, SEAFDEC Training Department (TD) continues closely collaborated with the SEAFDEC Member Countries and potential partners at national, sub-regional, and regional levels to support MCs on fisheries resources and marine environmental survey. M.V. SEAFDEC 2. The major components of utilization of M.V. SEAFDEC 2 are (1) Marine fisheries resources research survey; (2) Marine environmental oceanographic research survey; (3) Onboard navigation and marine engineering training; and (4) Sea trial on fishing operation, oceanographic instruments, and fishing vessel.

SEAFDEC/TD will seek for opportunity to learn and improve the hydroacoustic equipment *e.g.* scientific echo sounder to investigate abundance of small pelagic resources, bottom mapping sonar to investigate the bottom characteristic of fishing ground which can support to SEAFDEC MCs

### 2. Outcome, Outputs and Activities and Proposed Budget

(Unit: USD)

Proposed Activities	Descriptions	Proposed Budget
<b>Outcome 1:</b>	National fisheries management by using the update reference data and information from the Marine Fisheries Resources and Marine Environment survey	-
<b>Output 1:</b>	A set of scientific data <i>i.e.</i> fisheries resource, marine environmental and oceanography data collected from the cruise survey	-
Activity 1.1	Pending for the requesting in the 42 <sup>nd</sup> PCM	-
<b>Outcome 2:</b>	National fisheries resources and marine environmental survey conducted by SEAFDEC MCs	-
<b>Output 1:</b>	Competent researcher in the marine fisheries resources research survey	-
Activity 2.1	Pending for the requesting in the 42 <sup>nd</sup> PCM	-
<b>Output 2:</b>	Competent of SEAFDEC ship staffs (Navigators and Engineers) and researchers	-
Activity 2.3	Planning after for the requesting of SEAFDEC MCs on the utilization of M.V. SEAFDEC 2 in the 42 <sup>nd</sup> PCM	-

### 3. Implementation Plan of Activities in 2020

Activities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Output 1:</b>	Pending for requesting from Member Countries											
Activity 1.1												
<b>Output 2:</b>												
Activity 2.1												
Activity 2.2												

### 4. Expected Activity Results in 2020

Planned activity	Expected Activity Results
Activity 1. Marine Environment and Oceanographic Research Survey	A set of scientific data, <i>i.e.</i> fisheries resource, marine environmental and oceanography data collected from the cruise survey

<b>Planned activity</b>	<b>Expected Activity Results</b>
Activity 2 Human resources development	<ol style="list-style-type: none"> <li>1. Increase number of competent researchers, in the marine fisheries resources research survey.</li> <li>2. Skill and experience of ship staffs of SEAFDEC Training Department (Navigators and Engineers)</li> </ol>