



PROJECT DOCUMENT

PROPOSED ACTIVITIES FOR THE YEAR 2020

Project ID: 20206009

Program Category	ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title	Development of Stock Assessment Methods and Strengthening of Resources Management Measures for Tropical Anguillid Eel in Southeast Asia		
Program Strategy No.	I	Total Period	2020 - 2021
Lead Department	Secretariat (SEC)	Lead Country	None
Donor/Sponsor	Japanese ASEAN Integration Fund (JAIF)	Total Donor Budget	USD 790,123
Project Partner(s)	None	Budget for 2020	USD 323,000
Lead Technical Officer	Isao Koya, Assistant Project Manager for the JTF	Project Participating Country(ies)	All Members Countries

PART I: PROJECT DESCRIPTION

1. Executive Summary:

Tropical anguillid eel resources are utilized as direct human consumption worldwide. The demand and use of the tropical anguillid eel resources in Southeast Asia are increasing. For the sustainable resource use of the eel resources, effective resource management measures are urgently required in Southeast Asia. However, appropriate resource management measures have not been developed yet because of limited information and data relevant to the eel biology, catch history and statistics and aquaculture which result with a difficulty to conduct a comprehensive stock assessment of the eel resources stock in Southeast Asia. The two-year first phase project entitled 'Enhancing sustainable utilization and management scheme of tropical anguillid eel resources in Southeast Asia (August 2017 – July 2019)' has been conducted since July 2017 by the Southeast Asian Fisheries Development Center (SEAFDEC) in close cooperation with ASEAN Member States (AMS) to develop eel fishery statistics and data collection system, examine the status of tropical anguillid eel species in AMS, and improve eel aquaculture activities. Under the project, surveys were conducted to collect basic eel fishery statistics and data in selected AMS (i.e. Cambodia, Indonesia, Myanmar, Philippines, Thailand and Vietnam); policy recommendations and guidelines were developed to assist AMS in initiating and improving eel resource management practices in the respective countries; and researches were conducted to improve the survival rate of juvenile eels in aquaculture practices.

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At the initial stage, eel fishery statistics and data collection system was not fully operated to obtain all of the required data and information. In order to take effective resources management measures for the sustainable use of tropical anguillid eel species, it is necessary to assess the abundance of eel resources stocks and grasp the appropriate total allowable catch level.

This project is proposed to collect the catch data and biological/ecological information for the estimation of the abundance of eel resources stocks, and to develop mathematical/statistical methods for estimating tropical anguillid eel resources stocks, in order to formulate effective management measures on tropical anguillid eel resources in Southeast Asia.

2. Background and Justification:

(a) Current Problem

Through the progress and results of the current (first phase) project implemented by SEAFDEC in close cooperation with AMS, it has become evident that the implemented activities in regard to the management of tropical anguillid eel resources in AMS are still at the initial stage. The trends of stock abundance, areas of distribution, and stock structure of the tropical anguillid eel species are unknown, and consequently a lack of the relevant information prevents AMS from determining the allowable catch limit of tropical anguillid eels. In order to control and manage the eel resources for the sustainable use and long-term persistence, it is necessary for AMS to develop and improve tools/methods for the sound management of the anguillid eel resources.

Globally, the conservation and management of the eel species are currently main issues to be addressed adequately. For example, a lack of proper legal framework results in the failure in eel fisheries management. Legally-binding fisheries management measures specific to the tropical anguillid eels have been so far limited and implemented only in two AMS (i.e. Indonesia and Philippines) that restrict exporting the tropical eels at a certain size. It is urgently needed to formulate effective management measures based on eel stock and precious distribution, and diversity in Southeast Asia in continued cooperation and coordination within AMS.

(b) Regionality

Southeast Asia is home to several tropical anguillid eel species (e.g., Arai et al., 1999). Eight species/sub-species of the tropical anguillid eels distribute in the Indo-Pacific region. Similar to European eels, American eels, and Japanese eels in their native ranges, the tropical anguillid eels are utilized in Southeast Asia for the direct human consumption locally as well as for the trade globally. The recent listing of European eels in the CITES Appendix II in 2007 as well as the recent export ban of those from the EU member states in 2010 may result in increased exploitation of the tropical anguillid eels. Therefore, it is important for AMS to develop effective management policies and actions for the sustainable use of the tropical anguillid eels in Southeast Asia.

(c) Project History

The two-year first phase project entitled 'Enhancing Sustainable Utilization and Management Scheme of Tropical Anguillid Eel Resources in Southeast Asia (August 2017 – July 2019)' has been implemented since July 2017 by SEAFDEC in close cooperation with AMS to develop eel fishery statistics & data collection system, examine the status of tropical Anguillid eel species in AMS, and improve eel aquaculture activities. Under the project, surveys were conducted to collect basic eel fishery statistics and data in selected AMS, policy recommendations and guidelines were developed to assist AMS in initiating and improving eel resource management practices in respective countries, and researches were conducted to improve the survival rate of juvenile eels in aquaculture practices.

For developing effective resource management measures for tropical anguillid eels, it is essential to develop appropriate methods for assessing a stock of tropical Anguillid eel resources and for estimating the total allowable catch for the sustainable use of the eel resources.

This project will therefore allow AMS to obtain all of the required data and information, such as long-term catch data, precise distributions and diversity, and reliable trade data of each of the tropical anguillid eel species. With these data and information, AMS will be able to estimate, for instance, the allowable catch limit to secure the sustainable use of tropical anguillid eel resources.

3. Gender Sensitivity of the Project

The project is not gender-sensitive but neutral and equalized. Both male and female can participate in all the proposed activities.

4. Project Goal, Outputs, Activities, Indicators and Verification:

4.1 Logical Framework

GOAL (Overall Objectives)		
<p>The objectives of this project are to collect the catch data and biological/ecological information for the estimation of eel resources stocks, and to develop mathematical/statistical methods for estimating tropical anguillid eel resources stocks in order to formulate effective management measures for the sustainable use of tropical anguillid eels in Southeast Asia.</p>		
OUTPUT	Indicator (to measure the project's achievements)	Means of Verification
<p>Outputs 1:</p> <p>In order to estimate resources stock status of the tropical anguillid eel species,</p> <p>1-1 Catch and fishing effort data for anguillid eel species C in AMS are collected.</p> <p>1-2 Biological and ecological data/information of the tropical anguillid eels that contribute to the estimation of eel stock abundance in AMS are collected.</p> <p>1-3 Current distributions of the tropical anguillid eels and their diversities in AMS are identified.</p>	<p>Indicators 1:</p> <p>1-1 Catch and fishing effort data by eel species and region are properly collected.</p> <p>1-2 Biological and ecological data and information are properly collected.</p> <p>1-3 Genetic data and information are properly collected.</p>	<p>Means of Verifications 1:</p> <p>1-1 Confirm that contents of the data include the data suitable for the purpose, such as catch amount by species/by growth stage/by region.</p> <p>1-2 Confirm that the contents of collecting data include characteristics of key habitats and length composition of all stages of eels from the selected fishing ground.</p> <p>1-3 Confirm that the contents of collecting data include several genetic indices for analysis at population level from the eels collected from several locations.</p>
ACTIVITY 1		
<p>Main Activities 1:</p> <p>1-1 To collect data on catches and catch efforts by species and by life history stage (glass eel, and elver/yellow eel) in AMS where eel fisheries occur in order to properly assess stock status. For this purpose, field surveys visiting several places in AMS are conducted to:</p> <p>1-2 To collect field data to better understand biology and ecology, including habitat and its surrounding environment, of the tropical anguillid eel species. Field surveys at several rivers in AMS are conducted to:</p> <p>1-3 To collect genetic data to understand distribution, the level of diversity, and stock structure of the tropical anguillid eel species.</p>		
OUTPUT 2	Indicator (to measure the project's achievements)	Means of Verification
<p>Outputs 2:</p> <p>2-1 Annual catch and CPUE are estimated.</p> <p>2-2 Methods for the comprehensive stock assessment of tropical anguillid eels are developed.</p> <p>2-3 Methods for calculation of allowable catch of tropical anguillid eels are developed.</p>	<p>Indicators 2:</p> <p>2-1 Accurate annual catch and historical CPUE are estimated.</p> <p>2-2 Methods for estimating stock biomass are developed and stock biomass (and trend) is estimated using a developed method.</p> <p>2-3 Methods for estimating allowable catch limit and</p>	<p>Means of Verifications 2:</p> <p>2-1 Review of monthly catch and calculated CPUE by month.</p> <p>2-2 Progress reports and review by experts.</p> <p>2-3 Progress reports and review by experts and managers.</p>

	allowable catch are estimated using developed methods.	
ACTIVITY 2		
Main activities 2: 2-1 Analyze catch per unit fishing effort (CPUE), including accurate data collection through regular surveys and selection an appropriate catch effort. 2-2 Develop methods for estimating abundance trend of the eel stocks. Making manual for methods of assessment stock on tropical anguillid eel. 2-3 Develop appropriate methods for estimating allowable catch limit that will secure sustainable use of tropical anguillid eel resources.		
OUTPUT 3	Indicator (to measure the project's achievements)	Means of Verification
Output 3: 3. Effective management measures based on assessment of tropical anguillid eel stocks are proposed, formulated and centralized/harmonized to secure sustainable use and long-term persistence of tropical anguillid eel resources in AMS.	Indicator 3: 3. Metrology on effective management of the tropical anguillid eels are enhanced and management measures are proposed, formulated in AMS.	Means of Verification 3: 3. Review the project report and confirm that the report includes content on resource management methods, data collection system, technology of assessment resource stock.
ACTIVITY 3		
Main activity 3: 3-1 Examine validities of developed methods of stock assessment for eel resources stocks. 3-2 Disseminate developed methods of the stock assessment of tropical anguillid eel to AMS. 3-3 Develop a manual for AMS to formulate the effective resources management based on the assessment of tropical anguillid eel stocks. For the above activities, "Regional Meeting "will be held three times at the inception, mid-term and final of the project period.		

4.2 Project Implementation Plan for 2020 - 2021

Activities	2020				2021			
	1	2	3	4	1	2	3	4
Activity 1.1								
Activity 1.2								
Activity 1.3								
Activity 2.1								
Activity 2.2								
Activity 2.3								
Activity 3.1								
Activity 3.2								
Activity 3.3								

4.3 Proposed Budget for 2020 - 2024

(Unit: USD)

Output	Activities	Year 1 (2020)	Year 2 (2021)	Total
Output 1	Activity 1.1	104,000	121,498	225,498

	Activity 1.2	77,500	24,650	122,150
	Activity 1.3	36,000	30,550	66,550
Output 2	Activity 2.1 Activity 2.2 Activity 2.3	65,500	68,910	134,410
Output 3	Activity 3.1 Activity 3.2 Activity 3.3	40,000	70,286	110,286
Sub-Total		323,000	315,894	658,894
Other budget (management cost and contingency fee)				131,229

PART II: PROJECT ACHIEVEMENTS IN 2019

Note: No information in 2019 since this project start at 2020 and project period is January 2020-December 2021.

PART III: PROPOSED ACTIVITIES FOR THE YEAR 2020

1. Project Summary in 2020:

In 2020, the following activities will be carried out in the project

1. Collect catch data /aquaculture production

In order to grasp the catch and aquaculture production of tropical anguillid eels, a system to collect statistical data will be constructed in countries where have eel fisheries / aquaculture.

2. Collect biological data / catch and fishing effort data

In order to assess eel stocks, the system of collecting catch data including fishing effort information on caught directly by fishermen.

3. Collect genetic data

Collect tropical eel genetic data from eel habitats in Indonesia, Myanmar, Philippines and Vietnam, and conduct research and analysis to clarify population genetic structure.

4. Develop methods for assessment eel stock

Preparations for developing a method for assessment of eel stock based on information on catch and catch effort data will start.

5. Regional Meeting/Planning Meeting

The Regional meeting will be held to share fishing and ecological data and information on tropical anguillid eels between AMS. At this meeting, information will be shared with AMS regarding the status of various data collection, analysis results, and technical methods for resource stock assessment.

The project planning meeting will be held to design the details of the project activities with AMS representatives.

2. Outputs and Activities and Proposed Budget:

(Unit: USD)

Proposed Activities	Descriptions	Proposed Budget
Output 1	Outputs 1: In order to estimate resources stock status of the tropical anguillid eel species, <ul style="list-style-type: none"> • Catch and fishing effort data for anguillid eel species in AMS are collected. • Biological and ecological data/information of the tropical anguillid 	

Proposed Activities	Descriptions	Proposed Budget
	<p>eels that contribute to the estimation of eel stock abundance in AMS are collected.</p> <ul style="list-style-type: none"> • Current distributions of the tropical anguillid eels and their diversities in AMS are identified. 	
Activity 1.1	<p>To collect data on catches and catch efforts by species and by life history stage (glass eel, and elver/yellow eel) in AMS where eel fisheries occur in order to properly assess stock status. <i>Fishery / aquaculture statistical surveys will be conducted in AMS. Estimated expenditures:</i> <i>Reward for fishermen to collect catch data and another statistical data = US\$ 30,000</i> <i>Explanation meeting of statistical survey in AMS (6countries)= US\$ 54,000</i></p> <ul style="list-style-type: none"> • <i>Traveling cost = US\$ 4,300</i> • <i>Daily subsistence allowance = US\$ 1,500</i> • <i>Accommodation = US\$ 1,700</i> • <i>Rental /Others = US\$ 1,500</i> <p><i>Sub total = US\$ 9,000 ×6 countries = US\$ 54,000</i></p> <p><i>Expenditure for entrusting the survey and analysis data to a consultant company/research institute =US\$ 20,000</i></p>	104,000
Activity 1.2	<p>To collect field data to better understand biology and ecology, including habitat and its surrounding environment, of the tropical anguillid eel species.</p> <p><i>Estimated expenditures:</i> <i>Reward for fishermen for collecting catch data = US\$ 30,000</i> <i>Designing and install fishing gears = US\$ 20,000</i> <i>Designing/Construction/Install/Collecting data survey=US\$ 27,500</i></p> <ul style="list-style-type: none"> • <i>Traveling cost = US\$ 2,500</i> • <i>Daily subsistence allowance = US\$ 1,000</i> • <i>Accommodation = US\$ 1,000</i> • <i>Rental /Others = US\$ 1,000</i> <p><i>Sub total = US\$ 5,500 ×5times = US\$ 27,500</i></p> <p><i>Design survey(1times), Construction survey (1times), Install of fishing gear (1times), Collecting data survey(2times) = Total 5times</i></p>	77,500
Activity 1.3	<p>To collect genetic data to understand distribution, the level of diversity, and stock structure of the tropical anguillid eel species. <i>Expenses for collecting DNA sample and analyzing population genetic structure</i> <i>Estimated expenditures:</i> <i>eDNA data collection survey =USD\$ 16,500</i></p> <ul style="list-style-type: none"> • <i>Traveling cost = US\$ 2,500</i> • <i>Daily subsistence allowance = US\$ 1,000</i> • <i>Accommodation = US\$ 1,000</i> • <i>Rental /Others = US\$ 1,000</i> <p><i>Sub-total = US\$ 5,500×3times =16,500US\$</i></p> <p><i>Analysis of DNA for sequencer processing</i></p> <ul style="list-style-type: none"> • <i>Sequencer processing = US\$ 15,000</i> 	36,000

Proposed Activities	Descriptions	Proposed Budget
	<i>Population genetic structure study</i> <ul style="list-style-type: none"> • <i>Traveling cost</i> = US\$ 2,000 • <i>Daily subsistence allowance</i> = US\$ 1,000 • <i>Accommodation</i> = US\$ 1,000 • <i>Rental /Others</i> = US\$ 500 <li style="text-align: right;"><i>Sub total</i> = US\$ 4,500 	
Output 2		
Activity 2.1 Activity 2.2 Activity 2.3	<ul style="list-style-type: none"> • Analyze catch per unit fishing effort (CPUE), including accurate data collection through regular surveys and selection an appropriate catch effort. • Develop methods for estimating abundance trend of the eel stocks. Making manual for methods of assessment stock on tropical anguillid eel. • Develop appropriate methods for estimating allowable catch limit that will secure sustainable use of tropical anguillid eel resources. <p><i>In order to carry out these activities, the analysis of catch data and biological data is entrusted to consultant companies/research institutions.</i></p> <p><i>Estimated expenditures:</i> Consignment expenses to consultants /research institute =US\$ 65,500</p>	65,500
Output 3	Effective management measures based on assessment of tropical anguillid eel stocks are proposed, formulated and centralized/harmonized to secure sustainable use and long-term persistence of tropical anguillid eel resources in AMS.	
Activity 3.1 Activity 3.2 Activity 3.3	<ul style="list-style-type: none"> • Examine validities of developed methods of stock assessment for eel resources stocks. • Disseminate developed methods of the stock assessment of tropical anguillid eel to AMS. • Develop a manual for AMS to formulate the effective resources management based on the assessment of tropical anguillid eel stocks. <p><i>The Regional Meeting and the Planning Meeting will be held to carry out activities 3-1 ~ 3-3.</i></p> <p><i>Estimated expenditures:</i> <i>Planning Meeting:</i></p> <ul style="list-style-type: none"> • <i>Traveling cost</i> = US\$ 8,500 • <i>Daily subsistence allowance</i> = US\$ 4,000 • <i>Accommodation</i> = US\$ 3,500 • <i>Rental /Others</i> = US\$ 2,500 <li style="text-align: right;"><i>Sub total</i> = US\$18,500 <p><i>Regional meeting</i></p> <ul style="list-style-type: none"> • <i>Traveling cost</i> = US\$ 9,000 • <i>Daily subsistence allowance</i> = US\$ 5,000 • <i>Accommodation</i> = US\$ 4,500 • <i>Rental /Others</i> = US\$ 3,000 <li style="text-align: right;"><i>Sub total</i> = US\$21,500 	40,000

3. Implementation Plan of Activities in 2020:

Activities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Output 1:												
Activity 1.1												
Activity 1.2												
Activity 1.3												
Output 2:												
Activity 2.1												
Activity 2.2												
Activity 2.3												
Output 3:												
Activity 3.1												
Activity 3.2												
Activity 3.3												

4. Expected Activity Results in 2020:

Planned activity	Expected Activity Results
Activity 1.	
<p>Activity 1.1. To collect data on catches and catch efforts by species and by life history stage (glass eel, and elver/yellow eel) in AMS where eel fisheries occur in order to properly assess stock status.</p>	<ul style="list-style-type: none"> Describe major fishing grounds of tropical anguillid eels (all stages). Collect catch and fishing effort data to estimate the abundance of tropical anguillid eel resources stocks through catch information by fishers from regional fishing ground. Collect catch and fishing effort data to estimate the abundance of tropical anguillid eel resources stocks by conducting quantitative surveys using specific fishing gears at selected fishing grounds. Identify discrepancy of data, and its reasons, between international trade databases (UN, FAO, etc.) and domestic catch statistics/actual fishery catch.
<p>Activity 1.2. To collect field data to better understand biology and ecology, including habitat and its surrounding environment, of the tropical anguillid eel species.</p>	<ul style="list-style-type: none"> Collect biological/ecological data by conducting quantitative survey using specific fishing gears at selected fishing grounds. Analyze length composition of the eels in order to examine biological and life history characteristics of the tropical anguillid eels in several sites in AMS.
<p>Activity 1.3. To collect genetic data to understand distribution, the level of diversity, and stock structure of the tropical anguillid eel species.</p>	<ul style="list-style-type: none"> Conduct genetic analysis to identify local and regional biodiversity of the tropical anguillid eels Conduct genetic analysis to address current spatial structure of the tropical anguillid eels for the genetic stock identification
Activity 2.	
<p>Activity 2.1.</p>	<ul style="list-style-type: none"> The trends of eel resources and stock

Planned activity	Expected Activity Results
Analyze catch per unit fishing effort (CPUE), including accurate data collection through regular surveys and selection an appropriate catch effort.	assessment using the collected catch / CPUE data will be analyzed.
Activity 2.2. Develop methods for estimating abundance trend of the eel stocks. Making manual for methods of assessment stock on tropical anguillid eel.	<ul style="list-style-type: none"> • Development of methods for assessment eel resources stock and the creation of a technical manual will be started.
Activity 2.3. Develop appropriate methods for estimating allowable catch limit that will secure sustainable use of tropical anguillid eel resources.	<ul style="list-style-type: none"> • The examination of the method to estimate the allowable catch by assessment of eel resources stock will be started.
Activity 3.	
Activity 3.1. Examine validities of developed methods of stock assessment for eel resources stocks.	<ul style="list-style-type: none"> • Attempts will be made to validity the developed resource assessment methods technique.
Activity 3.2. Disseminate developed methods of the stock assessment of tropical anguillid eel to AMS.	<ul style="list-style-type: none"> • Stock assessment techniques and catch information of tropical anguillid eel will be disseminated to AMS through regional meetings.
Activity 3.3. Develop a manual for AMS to formulate the effective resources management based on the assessment of tropical anguillid eel stocks.	<ul style="list-style-type: none"> • Preparation of a manual on effective resource management methods for tropical anguillid eel will be examined.