



PROJECT DOCUMENT

**Achievement for Year 2019
 AND
 Proposed Activities for the Year 2020**

Project ID: 201706006

Program Category	ASEAN-SEAFDEC ASSP and FCG Mechanism		
Project Title	Strengthening the Effective Management of Inland Fisheries and Aquaculture in AMS with GIS and RS Technology		
Program Strategy No.	I	Total Period	January 2019 - June 2020
Lead Department	Secretariat (SEC)	Lead Country	None
Donor/Sponsor	Japanese ASEAN Integration Fund (JAIF)	Total Donor Budget	USD 279,960
Project Partner	None	Budget for January 2019- June 2020	USD 279,960
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:

Inland fisheries and freshwater aquacultures in the Southeast Asia region as major fish producers have provided various kinds of fish products to the world-wide markets. In Southeast Asia, the inland fishery and aquaculture are important field, which have much production volume compared to other areas.

On the other hand, inland fishery resources are particularly susceptible to the influence of environmental factors such as rainfall and water temperature and catch pressure by fishery. compared to the marine fisheries.

As a result, this has often impeded the appropriate fisheries and aquaculture management measures and guidance for the fishers and farmers by the governments, which often causes seasonal overfishing, excess production, price fluctuation and low-valued fish production. In order to manage and use inland fishery resources, information on the environmental change of habitats affecting resources is necessary. However, such information is currently not sufficiently obtained. Using the Geographic Information System (GIS) and Remote Sensing (RS) technology, it became possible to grasp the environmental changes of environmental factor in the habitats of aquatic organisms affecting of inland fishery resources.

Considering those issues on inland fisheries and aquacultures, this project aims to map inland fishery and aquaculture sites in AMSs using GIS & RS technology, and proposes monitoring methodologies using GIS Mapping in order to enable government of AMSs to contribute in the effective management of inland fisheries and aquaculture with GIS & RS technology in AMSs. The project is going to be implemented GIS (Geographic information system) & RS (Remote sensing) by Southeast Asian Fisheries Development Center (SEAFDEC) for a period of one year.

2. Background and Justification:

2.1 Current Problem

Inland fishery resources are greatly affected by changes in the environment. For example, the catch of the inland fluctuates greatly depending on the extent of expansion and contraction of river and lake areas due to precipitation in the rainy season and dry season.

Also, inland fisheries resources are susceptible to environmental fluctuations and catch pressure because the area of the fishing ground is limited. It is necessary to manage the inland fisheries resources and to use them sustainably while taking environmental factors into consideration. However, management methods considering environmental factors have not been established. If the environmental factor mechanism that affects the inland fisheries resources is grasped by GIS/RS, the method of inland fisheries resource management will be newly presented. GIS Mapping, R / S technology is a method that can be used anywhere in AMSs.

2.2 Rationality

In Southeast Asia, the inland fishery and aquaculture are important field, which have much production volume compared to other areas. On the other hand, inland fishery resources are affected by environmental factors.

Several countries that are particularly active in the field of inland fishery among AMSs are selected as pilot site target countries and establish monitoring methods RS using GIS Mapping technology. The method will be disseminated to each AMSs.

2.3 Project History

No project on management scheme with GIS&RS technology of inland fishery and aquaculture has been implemented.

2.4 Beneficiaries

The relationship between catch and environmental data such as rainfall, area of inland fishing ground, temperature, etc. will become clear by using the GIS Mapping/RS technology. By doing so, we will be able to predict the catch amount to some extent. As a result, after the project is over, the fishers/farmers can obtain the environmental information affecting the catch by GIS Mapping/RS technology, and it becomes possible to obtain benefits indirectly that can continue to use fisheries resources effectively. In addition, government officials can learn techniques related to fishery resources management by acquiring GIS Mapping/RS technology during project implementation. 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)

This project aims to contribute in the effective management of inland fisheries and aquaculture in AMSs countries through the promotion of GIS Mapping/RS technology.

Using the GIS Mapping technique, the causal relation between the catch amount and the environmental data by the satellite on the R/S is clarified.		
OUTPUT 1	Indicator (to measure the project's achievements)	Means of Verification
Output 1: The geographical and environmental data on satellites and the catch data from the fishing ground in inland water of target sites in AMS are analyzed by GIS Mapping technology, and guideline of analytical method is created.	Indicator1.1: To clarify the relationship between graphical/environmental data by remote sensing and catch data on the fishing ground by GIS Mapping and multivariate analysis. Indicator1.2: The monitoring method for inland fisheries resources management by GIS Mapping /RS technology is proposed and guideline of analytical method is created.	Means of Verification 1.1 Whether the guideline of monitoring method is prepared or not. 1.2 An index value indicating the relationship between the environmental data and catch data by GIS Mapping and multivariate analysis is indicated. 1.3 Whether the guideline of monitoring method is prepared or not.
ACTIVITY 1		
1.1: Data of catch amount by fishing ground necessary for GIS Mapping analysis at project sites (The planned countries as project sites: Cambodia, Indonesia, Lao PDR, Myanmar, Thailand) are collected and compiled. 1.2: Environmental data on the geographical and inland water aquatic organism habitats based on satellite images for each target site of AMS are collected and compiled. 1.3: The relation among geographical/environmental data (Inland water area, precipitation amount, temperature etc.) based on satellites and the catch data from the fishing ground of target sites of AMS are analyzed and clarified with multivariate analysis by GIS Mapping technology.		
OUTPUT 2	Indicator (to measure the project's achievements)	Means of Verification
Output 2: Dissemination of the monitoring and analyzing GIS Mapping /RS technical methods on geographical / environmental data and catch amount data in AMS.	Indicator 2.1: A technical manual on analysis methods using GIS Mapping technology is produced. Indicator 2.2: The number of staffs who can analyze using GIS Mapping / RS technology increases in AMSs countries	Means of Verification 2: Technical manual on analysis methods using GIS Mapping technology The number of staff who can analyse using GIS Mapping / RS technology in target AMS
ACTIVITY 2		
Activity 2 Technical analysis method of GIS Mapping / RS to clarify the relationship between geographical/ environmental data and catch data is disseminated to AMSs. 2.1: To summarize the result of catch monitoring method using GIS Mapping/RS technology obtained through activity 1. 2.2: To create technical manual on analysis methods using GIS Mapping technology. 2.3: To hold the workshop on catch analysis using GIS Mapping /RS technology for disseminating technology to AMSs.		

4.2 Project Implementation Plan for 2019 - 2020

Activities	2019				2020	
	1	2	3	4	1	2
Activity 1.1						
Activity 1.2						
Activity 1.3						
Activity 2.1						
Activity 2.2						
Activity 2.3						

4.3 Proposed Budget for 2019 – 2020

(Unit: USD)

Output	Activities	Year 1 (2019)	Year 2 (2020)	Total
Output 1	Activity 1.1	71,249	71,500	142,749
	Activity 1.2	9,095	5,800	14,895
	Activity 1.3	7,840	15,700	23,540
Output 2	Activity 2.1		4,950	4,950
	Activity 2.2		29,570	29,570
	Activity 2.3		30,405	30,405
Project budget Sub-Total		88,184	157,925	246,109
Other budget (management cost and contingency fee)				33,851

PART II: PROJECT ACHIEVEMENTS IN 2019

1. Project Achievements in the Present Year (2019):

The achievement of the project in 2019 is as follows.

1. Collection of catch data

A system for collecting catch data from fishermen could be constructed at five sites in five AMS countries.

2. Collection of environmental data by satellites

A method for collecting environmental data (Inland waters area, Temperature of water surface, Rain fall, chlorophyll) by satellites has been established at five sites in five AMS countries, and work to collect the data is underway. It is necessary to correct the satellite data using the data actually measured at the site.

3. Data analysis

An analysis of the relationship between catch data and environmental data has been started and will be continued next year.

4. Summary of analysis results, manuals, and report creation

Preparations for the compilation of analysis results has been started and will be continued next year.

2. Activities and Budget in the Present Year:

Activities	Type of activity	Number of Participants			Budget Spent (USD)
		AMSS	SEAFDEC	Others	
Output 1:					
Activity 1.1	Survey/Meeting	11 (3)	15 (5)	114 (17)	71,249
Activity 1.2	Survey/Meeting	15 (1)	42 (10)	16 (2)	9,095
Activity 1.3	Analysis		2 (1)	3	7,840
Output 2:					
Activity 2.1	Analysis	This activity was not implemented in 2019			
Activity 2.2	Creating manual	This activity was not implemented in 2019			
Activity 2.3	Work shop	This activity was not implemented in 2019			

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

3. Expected Outcome/Outputs and Achievements:

Activities	Expected Outcome/Outputs	Results/Achievements
Output 1:		
Activity 1.1	Data of catch amount by fishing ground necessary for GIS Mapping analysis at project sites are collected and compiled	A system for collecting catch data from fishermen at five sites in five AMS countries could be constructed.
Activity 1.2	Environmental data on the geographical and inland water aquatic organism habitats based on satellite images for each target site of AMS are collected and compiled	A method for collecting environmental data (Inland waters area, Temperature of water surface, Rain fall, chlorophyll) by satellites has been established.
Activity 1.3	The relation among geographical/environmental data (Inland water area, precipitation amount, temperature etc.) based on satellites and the catch data from the fishing ground of target sites of AMS are analyzed and clarified with multivariate analysis by GIS Mapping technology	An analysis of the relationship between catch data and environmental data has been started and will be continued next year.
Output 2:		
Activity 2.1	This activity was not implemented in 2019	
Activity 2.2	This activity was not implemented in 2019	
Activity 2.3	This activity was not implemented in 2019	

4. List of Publications in 2019 (e.g. technical report(s), technical article(s), annual report(s), VDO, presentation file):

Publications	Type of Media	Attached e-file
There was no publication		

5. Evaluation on Workshops/Training Courses by Participants of AMSs:

Activities	Evaluation
Output 1:	
Activity 1.1	A system to collect inland water catch data at 5 sites in 5 countries of AMS was established. Catch data was collected.
Activity 1.2	Technique to download environmental data from satellites and collect data was acquired. Environmental data was collected.
Activity 1.3	Work to analyze the relationship between catch data and environmental data has started specifically.
Output 2:	
Activity 2.1	This activity was not implemented in 2019
Activity 2.2	This activity was not implemented in 2019
Activity 2.3	This activity was not implemented in 2019

6. Major Impacts and Issues:

In the 2019 project activities, a system to collect data from fishermen could be established at five inland water sites in five AMS countries. This collecting data system is that a fisherman record the daily catch on a sheet, and the enumerator collects the catch sheet from each fisherman. However, there are a variety of inland fisheries and types of fishing gear, and it is necessary to identify the fishing gear and give it a common name of Southeast Asia, but the classification work has not yet been completed. In 2020, it will be necessary to identify and classify common names of fishing gear.

The problem with environmental data collection by satellites is that satellite data cannot be collected every day. This is because in Southeast Asia, there are many cloudy days in the rainy season, and optical data cannot be obtained on cloudy days. As a result, a sufficient amount of data required for analysis cannot be collected in a one-year period. It is necessary to complement the collected data using past satellite data.

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. Collection of catch data, creation of database

Review the contents of the catch data recorded by fishermen at five sites in five AMS countries, and input the data into Excel to create a database.

2. Collection of environmental data by satellite and creation of database

Collect environmental data (site area, water temperature, rainfall, chlorophyll) in 5 sites and create a database.

In order to verify the environmental data by satellites, actual measurement data will be collected and the satellite data will be corrected based on the actual measurement values.

3. Analysis of the relationship between catch data and environmental data

Analyzes collected catch and environmental data using mathematical and GIS mapping / remote sensing techniques to clarify relationships. The analysis results will be edited and compiled.

4. Preparation of analysis manual and final report

Create a technical manual that shows how to analyze using GIS mapping/Remote sensing technology. The final report will be created.

5. Hold workshop to disseminate analytical methods

Workshops on analytical methods using GIS mapping/Remote sensing technology will be held to disseminate the technique to AMS.

2. Outputs and Activities and Proposed Budget:

(Unit: USD)

Proposed Activities	Descriptions	Proposed Budget
Output 1	The geographical and environmental data on satellites and the catch data from the fishing ground in inland water of target sites in AMS are analyzed by GIS Mapping technology, and guideline of analytical method is created.	
Activity 1.1	Data of catch amount by fishing ground necessary for GIS Mapping analysis at project sites (The planned countries as project sites: Cambodia, Indonesia, Lao PDR, Thailand) are collected and compiled <i>Estimated expenditures:</i> <ul style="list-style-type: none"> • <i>Reward for fishermen to collect data</i> = US\$ 27,000 • <i>Travel cost</i> = US\$ 15,000 • <i>Daily subsistence allowance</i> = US\$ 12,500 • <i>Accommodation</i> = US\$ 9,000 • <i>Hare /Rental Others</i> = US\$ 8,000 	71,500
Activity 1.2	Environmental data on the geographical and inland water aquatic organism habitats based on satellite images for each target site of AMS are collected and compiled <i>Estimated expenditures:</i> <i>Consultant fee for collecting data by satellite</i> US\$ 5,800	5,800
Activity 1.3	The relation among geographical/environmental data (Inland water area, precipitation amount, temperature etc.) based on satellites and the catch data from the fishing ground of target sites of AMS are analyzed and clarified with multivariate analysis by GIS Mapping technology <i>Estimated expenditures:</i> <i>Consultant fee for analysis between catch data and environmental data</i> =US\$6,000 <i>Working group meeting</i> <ul style="list-style-type: none"> • <i>Traveling cost</i> = US\$ 4,000 • <i>Daily subsistence allowance</i> = US\$ 2,000 • <i>Accommodation</i> = US\$ 1,500 • <i>Meeting package</i> = US\$ 1,500 • <i>Others</i> = US\$ 700 	15,700
Output 2		
Activity 2.1	To summarize the result of catch monitoring method using GIS Mapping/RS technology obtained through activity 1. <i>Estimated expenditures:</i> <i>Report of analysis making</i> =US\$ 1,200 <i>Technical Manual Making</i> =US\$ 2,250 <i>Consumable</i> =US\$ 1,500	4,950
Activity 2.2	To create technical manual on analysis methods using GIS Mapping technology. <i>Estimated expenditures:</i> <i>Analysis result report meeting(2times)</i> <i>Cost of 1times</i> <ul style="list-style-type: none"> • <i>Travel cost</i> = US\$ 5,000 	29,570

	<ul style="list-style-type: none"> • <i>Daily subsistence allowance</i> = US\$ 4,100 • <i>Accommodation</i> = US\$ 3,000 • <i>Hare /Rental Others</i> = US\$ 2,700 <li style="padding-left: 20px;"><i>Sub total</i> = US\$ 14,800 	
Activity 2.3	<p>To hold the workshop on catch analysis using GIS Mapping /RS technology for disseminating technology to AMSs.</p> <p><i>Estimated expenditures:</i> <i>Workshop for disseminating GIS mapping/RS technology</i></p> <ul style="list-style-type: none"> • <i>Traveling cost</i> = US\$ 6,000 • <i>Daily subsistence allowance</i> = US\$ 3,000 • <i>Accommodation</i> = US\$ 3,000 • <i>Meeting package</i> = US\$ 2,000 • <i>Others</i> = US\$ 1,200 <li style="padding-left: 20px;"><i>Sub total</i> =15,200(2times) =US\$ 30,405 	30,405

3. Implementation Plan of Activities in 2020:

Activities	Jan	Feb	Mar	Apr	May	Jun
Output 1:						
Activity 1.1						
Activity 1.2						
Activity 1.3						
Output 2:						
Activity 2.1						
Activity 2.2						
Activity 2.3						

4. Expected Activity Results in 2020:

Planned activity	Expected Activity Results
Activity 1.	
Activity 1.1. Data of catching amount by fishing ground necessary for GIS mapping analysis at project sites in AMS are collected and compiled	<ul style="list-style-type: none"> • To collect catch data by fishing ground in catching areas of fisheries resources in target sites of each country. The fisheries data index CPUA (catch per unit area) will be designed such as catch amount, fisheries type, number of fishing operation, which can help to get enough raw data for research. • To process and compile the catch amount data from the fishing ground in target sites of AMS, Digitization work will be done to store the collected data in the database. A certain method will be applied to remove the wrong data.
Activity 1.2. Environmental data on the geographical and inland water aquatic organism habitats based on satellite images for each target site of AMS are collected and compiled	<ul style="list-style-type: none"> • To analyze which satellite sources can provide the suitable and reliable geographical/environmental data on the target fisheries area, and collect them, where a series of necessary index will be predefined such as

Planned activity	Expected Activity Results
	<p>land surface temperature, water area, phytoplankton abundance (chlorophyll-a), rain fall, etc.</p> <ul style="list-style-type: none"> • To process and compile the geographical and environmental data based on satellites. If possible, the data in recent several years will be processed and stored so as to analyze the development trend by satellite of the target site of each country
<p>Activity 1.3 To clarify the illation among geographical/environmental data based on satellites and the catch data from the fishing ground of target sites of AMS are analyzed and clarified with multivariate analysis by GIS mapping technology</p>	<ul style="list-style-type: none"> • To analyze all the collected data in target sites of each country by various GIS mapping and analysis technologies • To consider the suitable catch monitoring method with multivariate analysis using GIS mapping technology.
<p>Activity 2.</p>	
<p>Activity 2.1. To summarize the result of catch monitoring method using GIS Mapping/RS technology obtained through activity 1.</p>	<ul style="list-style-type: none"> • Catch data and satellite environmental data collected at five sites are analyzed and compiled the results.
<p>Activity 2.2 To create technical manual on analysis methods using GIS Mapping technology.</p>	<ul style="list-style-type: none"> • Manuals on technical methods for analyzing catch and environmental data will be prepared.
<p>Activity 2.3 To hold the workshop on catch analysis using GIS mapping /RS technology.</p>	<ul style="list-style-type: none"> • Analytical techniques using GIS mapping technology will be disseminated to AMS through workshop.