

Country Name	The Project for Improving Operations and Maintenance of National Irrigation Systems
Republic of the Philippines	

I. Project Outline

Background	<p>In 2009, about 50% of the total irrigated areas in the Philippines was covered by the National Irrigation Systems (NISs) numbering 212 in total which are operated and managed by the National Irrigation Administration (NIA). However, as maintenance and rehabilitation records for the irrigation facilities were insufficiently kept, it was difficult to carry out systematic rehabilitation and improvement works before the national irrigation facilities became non-functional due to aging.</p> <p>Under this circumstance, NIA implemented the Irrigation Management Transfer (IMT) program, which aimed at transferring the NIS maintenance and management tasks to local water users' associations (or Irrigators' Associations) starting in 2008, along with the Rationalization Plan (RAT Plan) that aimed at reducing the number of NIA personnel in anticipation of the transfer of tasks on irrigation facility maintenance and management. While the RAT plan and personnel reduction proceeded as planned, the transfer of tasks however, has not been fully implemented, thus NIA continues to be responsible for irrigation maintenance work. As a result, NIA had difficulty implementing appropriate operations and maintenance (O&M) for the 212 NIS nationwide.</p>														
Objectives of the Project	<p>Through (i) formulation of Farmland Geographic Information System (FGIS) for O&M activities, (ii) introduction of Asset Management (AM) concept for O&M activities, and (iii) improvement of fair Water Distribution and Delivery (WDD) for O&M, the project aimed at establishing an O&M system of NAI at the pilot NISs, thereby promoting the adaption of the improved O&M system in other NISs.</p> <p>1. Overall Goal: The improved Operations and Maintenance (O&M) system of the Project is adopted in other National Irrigation Systems (NISs).</p> <p>2. Project Purpose: An O&M system of pilot National Irrigation Systems (NISs) is established at NIA.</p>														
Activities of the project	<p>1. Project site: 10 NIS in Luzon (Amburayan RIS, UPRIIS Division 5, Pampanga Delta RIS, Caguray RIS, Visayas (Mambusao RIS, Barotac Viejo RIS, Malinao RIS), and Mindanao (Lower Agusan River Pump Irrigation Scheme (LARPIS), Lasang RIS, Padada RIS). The target areas for activity (i) mentioned below are all 10 NIS mentioned above, while the target areas for activity (ii) are the three (3) NIS (Pampanga Delta, Malinao, Lower Agusan River PIS). The target area for activity (iii) is the Amburayan NIS.</p> <p>2. Main activities: (i) formulation of Farmland GIS (FGIS) for O&M activities, (ii) introduction of Asset Management (AM) concept for O&M activities, and (iii) improvement of fair Water Distribution and Delivery (WDD) for O&M</p> <p>3. Inputs (to carry out above activities)</p> <table border="0"> <tr> <td>Japanese Side</td> <td>Philippine Side</td> </tr> <tr> <td>1) Experts: 3 persons</td> <td>1) Staff allocated: 3 (excluding Technical Working Group (TWG) members at NIA Central and Field Offices) persons</td> </tr> <tr> <td>2) Trainees received in Japan: 41 persons</td> <td>2) Office space and utilities</td> </tr> <tr> <td>3) Third country training (Cambodia): 3 persons</td> <td>3) Operational cost</td> </tr> <tr> <td>4) Equipment: PCs, GPS devices, geographic information system (GIS), Auto computer aided design (CAD), Network Attached Storage (NAS), Schmidt Rebound Hammer, Digital Water Velocity, etc.</td> <td></td> </tr> <tr> <td>5) Local Cost: Air fare, travel allowance, contract with local consultants/NGO, etc.</td> <td></td> </tr> </table>			Japanese Side	Philippine Side	1) Experts: 3 persons	1) Staff allocated: 3 (excluding Technical Working Group (TWG) members at NIA Central and Field Offices) persons	2) Trainees received in Japan: 41 persons	2) Office space and utilities	3) Third country training (Cambodia): 3 persons	3) Operational cost	4) Equipment: PCs, GPS devices, geographic information system (GIS), Auto computer aided design (CAD), Network Attached Storage (NAS), Schmidt Rebound Hammer, Digital Water Velocity, etc.		5) Local Cost: Air fare, travel allowance, contract with local consultants/NGO, etc.	
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Project Period	(ex-ante) March 2013-March 2017 (actual) May 2013-April 2017	Project Cost	(ex-ante) 262 million yen, (actual) 301 million yen												
Implementing Agency	Irrigation Engineering Center (IEC) of the National Irrigation Administration (NIA)														
Cooperation Agency in Japan	n.a.														

II. Result of the Evaluation

<Constraints on Evaluation >

- Due to COVID-19 quarantine and mobility restrictions, face-to-face meetings with former project counterparts and onsite interviews with project beneficiaries were not conducted. As such, collecting information and data necessary for this ex-post evaluation took longer time than usual. Online meetings and interviews with former NIA project counterparts were instead carried out.

< Special Perspectives Considered in the Ex-Post Evaluation >

- The continuation status of indicator 3 of the Project Purpose is assessed under Sustainability.

1 Relevance

<Consistency with the Development Policy of the Philippines at the Time of Ex-Ante Evaluation >

The project was consistent with the development policy of the Philippines. In the "Philippine Development Plan" (PDP 2011-2016), the Government of Philippines advocated the goal of "inclusive growth" that would lead to equitable benefits from economic growth and poverty reduction for the people. Since poverty incidence consistently registered high in the rural areas, and much higher for farmers, stabilization of agricultural production and improvement of productivity, including avoiding risks such as natural disasters and climate change, were important not only for ensuring a stable supply of food but also for achieving poverty reduction.

<Consistency with the Development Needs of the Philippines at the Time of Ex-Ante Evaluation >

The project was consistent with the development needs of the Philippines for improvement in O&M of the irrigation system. As mentioned above, due to the inappropriate O&M and insufficient records, systematic renovation was not carried out for the NIS.

<Consistency with Japan's ODA Policy at the Time of Ex-Ante Evaluation>

The project was also consistent with the Japan's ODA policy to the Philippines. The "Country Assistance Policy to the Republic of the Philippines" (April 2012) stated that the basic policy of assistance was to implement economic cooperation to achieve the Philippine government's goal of "inclusive growth," and lists "overcoming vulnerabilities and stabilizing livelihoods and production infrastructure" as one of the priority areas. Support for the agriculture and irrigation sectors was classified as a development issue under this category.

<Evaluation Result>

Considering the above, the relevance of the project is evaluated high.

2 Effectiveness/Impact

<Status of Achievement of the Project Purpose at the time of Project Completion>

The Project Purpose was not achieved at the time of project completion. The O&M system of the pilot NIS was not established at NIA because: (1) data collection and validation was not completed in 7 of the 10 pilot NIS thus FGIS was not utilized (Indicator 1), (2) Memorandum circulars were only issued for adopting AM but none was issued for adopting FGIS and WDD (Indicator 2) although Memo circulars adopting FGIS and WDD were issued 2 or 3 years after project completion, and that (3) the operating capability of NIA and Irrigator's Associations was found to be lacking, although some progress was observed (Indicator 3). The consistent changes in the project design for specification to make project implementers (NIA counterparts) understand better, such as reclassification of outputs and activities during the project period. The work delay due to natural disaster could have attributed to the limited achievement of planned outputs and Project Purpose at the time of project completion. Especially because of lack of information and delay in data collection for FGIS, mainly due to the Bohol Earthquake and the Typhoon Yolanda in 2013, the project did not reach the point where the project could utilize it for actual maintenance and management. While NIA took some time to finish the FGIS in all pilot sites, they committed to complete all remaining activities after project completion. In fact, NIA was able to cascade FGIS to other non-pilot sites nationwide during the project period.

<Continuation Status of Project Effects at the time of Ex-post Evaluation>

Project effects have been fully realized and have continued even after project completion as evidenced by the following: (1) FGIS has been implemented in all 10 pilot NIS since 2020, and data have since then been updated and maintained. (2) Memo circulars were issued and remained in effect for adopting FGIS, AM and fair WDD. Also, the 7 pilot NIS which were not able to finish data collection and validation during the project period were able to complete the said process in late 2017 (4 NIS) and in 2020 (3 NIS)

<Status of Achievement for Overall Goal at the time of Ex-post Evaluation>

The Overall Goal of the project has been achieved based on the following evidences:

(1) 78 non-pilot NIS have been adopting/implementing improved O&M system at the time of ex-post evaluation, in addition to 10 pilot NIS (Indicator 1). This expansion has become possible due to the following reasons: (i) NIA secured a budget from the central government to promote and disseminate FGIS in all 259 NIS, (ii) main parts of FGIS such as surveys, mapping, etc. were outsourced to consultants or contractors under close supervision and management of NIA personnel under the new organizational structure, (iii) to ensure the application of improved O&M to non-pilot NIS, NIA created an FGIS Unit under its IEC section of NIA-central office. Based on a concrete plan that facilitated the securement of the necessary budget from the central government, NIA is continuously implementing the promotion and dissemination of the improved O&M introduced by the project to all 259 NIS nationwide. With 88 NIS already adopting improved O&M (including 10 pilot sites), NIA is planning to apply the improved O&M system in other 171 NIS nationwide (targeting 60 NIS in 2021, 69 in 2022, 42 in 2023 and 7 NIS in 2024).

(2) The real irrigation areas of NIS that have been adopting and implementing the improved O&M system introduced by the project were corrected and validated (Indicator 2). Some NIS found to have overestimated irrigation areas than what have been previously declared (i.e., 7 of the 10 pilot NIS) while others found to have underestimated irrigation areas (i.e., 3 of the 10 pilot NIS). Because of the improved O&M systems (e.g., improved water management, FGIS survey, etc.), some NIS were able to restore previously non-operational areas, and generate new service areas.

<Other Impacts at the time of Ex-post Evaluation>

The following impacts have been observed: (1) informed decision-making can already be made (such as appropriate water apportioning) because NIS data has become accurate and reliable (such as actual or real irrigation area), and (2) evidence-based planning for engineering interventions such as construction, repairs, etc. is made possible because of the integration of flood and landslide-prone areas in the data-base system

No negative impacts on the natural environment have been observed. There were no issues on land acquisition and resettlement accordingly.

<Evaluation Result>

Therefore, the effectiveness/impact of the project is evaluated fair.

Achievement of Project Purpose and Overall Goal

Aim	Indicators	Results	Source										
(Project Purpose) An O&M system of pilot National Irrigation Systems (NISs) is established at NIA.	Indicator 1 Farmland GIS of O&M is implemented in the pilot NISs.	Status of the Achievement: not achieved (achieved) (Project Completion)	<ul style="list-style-type: none"> JICA documents Questionnaires from NIA Interviews with former NIA counterparts 										
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Indicator 3 Irrigation stewards (NIA, IAs) have sufficient operating capability in the pilot NISs.	<p>Status of the Achievement: partially achieved (partially continued) (Project Completion) An integrated information system using satellite images was established. The staff in charge participated in many training courses to learn the necessity of this activity and deepen their understanding of the contents and were able to operate the system. The fact that more than 1,000 people were trained for the application of FGIS is a good sign for the future expansion of this activity. NIA and IAs have improved their operational capacity, although it was not enough.</p>	JICA documents																																				
(Overall Goal) The improved Operations and Maintenance (O&M) system of the Project is adopted in other	<p>Indicator 1 At least one NIS/region adopts improved O&M systems.</p> <p>Status of achievement (at the time of ex-post evaluation): achieved (Ex-post Evaluation)</p> <table border="1"> <thead> <tr> <th>Year</th> <th>Regions adopting improved O&M systems (FGIS)</th> <th>Total NIS</th> </tr> </thead> <tbody> <tr> <td>Before or on April 2017</td> <td>Pilot NIS (Malinao, LARPIS, Padada)</td> <td>3</td> </tr> <tr> <td>Since late 2017</td> <td>Pilot NIS</td> <td>4</td> </tr> <tr> <td>Since 2018</td> <td>Non-pilot NIS in Regions I-XII (except IV-A)</td> <td>61</td> </tr> </tbody> </table>	Year	Regions adopting improved O&M systems (FGIS)	Total NIS	Before or on April 2017	Pilot NIS (Malinao, LARPIS, Padada)	3	Since late 2017	Pilot NIS	4	Since 2018	Non-pilot NIS in Regions I-XII (except IV-A)	61	<ul style="list-style-type: none"> • Questionnaires from NIA • Interviews with former NIA counterparts 																								
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National Irrigation Systems (NISs).		and V), CARAGA (Region XIII), CAR, MARIIS (Div 1)		
	Since 2020	Remaining Pilot NIS	3	
		Non-pilot NIS in Regions IV-A, V and MARIIS (Div 3)	7	
		Total number of NIS adopting improved O&M	78	
Indicator 2 In all NISs which have introduced improved O&M system, the real irrigation area after introducing improved O&M system is expanded more.	Status of achievement (at the time of ex-post evaluation): partially achieved (Ex-post Evaluation)			<ul style="list-style-type: none"> Questionnaires from NIA Interviews with former NIA counterparts
	Name of NIS	FUSA* (Before Project)	FUSA (After Project)	
	Amburayan RIS	3,271.54	3,049.97	
	UPRIIS Division 5	17,571.81	18,680.13	
	Pampanga Delta RIS	10,878.99	10,875.00	
	Caguray RIS	1,990.00	4,361.35	
	Mambusao RIS	1,372.00	979.70	
	Barotac Viejo RIS	1,825.00	2,208.81	
	Malinao RIS	4,740.80	4,726.00	
	Lower Agusan River RIS	3,927.88	2,484.43	
	Lasang RIS	4,928.92	1,314.98	
	Padada RIS	3,015.00	1,957.58	
	* Firmed-Up Service Area (the area that is being irrigated for crop production and less the areas that cannot be irrigated (such as converted area, permanently non-restorable area and newly generated area).			

3 Efficiency

Although the project period was as planned, the project cost exceeded the plan (the ratio against the plan: 100%, and 115%, respectively). The outputs were partially produced. Because of combined factor, the project cost exceeded the plan. Therefore, the efficiency of the project is evaluated fair.

4 Sustainability

<Policy Aspect>

There have been various policies, guidelines formulated and issued by NIA to promote and disseminate the improved O&M system introduced by the project. Some of these policies and guidelines include: (1) Memo circular concerning installation of virtual private network (PVN) under FGIS (issued in 2020), (2) Guidelines on the proper O&M of irrigation/drainage facilities (issued in 2014) and proper procedures in the operation of gates (issued in 2015), and (3) Memo circular concerning adjustment of cropping calendar and Pattern of Planting to ensure fair WDD especially during typhoon season (issued in 2020). These policies expressed in the form of NIA memorandum circulars are consistent and aligned with the current Philippine Development Plan (PDP 2017-2022) that emphasizes sustainable and resilient agricultural production and food security as elaborated in Outcome 1 of Chapter 8 of the PDP 2017-2022.

<Institutional/Organizational Aspect>

There have been no changes in the organizational structure/setting to promote and disseminate the improved O&M system introduced by the project. To ensure the promotion and dissemination of NIS improved O&M system, NIA created an FGIS Unit under the Irrigation Engineering Center (IEC) section of NIA.

NIA has had certain number of staff to promote and disseminate the improved O&M system of NIS introduced by the project. At the time of ex-post evaluation, the FGIS unit has had 4 staff members, while the Systems Operations Section (SOS) and the Systems Improvement Section (SIS) which have promoted and disseminated AM and WDD system improvements have had altogether 15 staff members. Whenever required, NIA hires additional staff under the Job Order (JO) status of employment. Although the number of staff has been insufficient, with the on-going process of re-organization of the Agency's structure, the gap will hopefully be addressed.

<Technical Aspect>

The technical capability is ensured as FGIS has already been implemented 210 NIS and 137 NIS is already completed.

The NIA staff is able to sustain the knowledge and skills necessary to promote and disseminate the NIS improved O&M system introduced by the project by: (1) Conducting trainings to Regional/field offices using the guidelines and manuals produced by the project. At the time of ex-post evaluation, 12 national training courses were conducted by former project counterparts of NIA based on the requests of NIA Regional/field offices, (2) Conducting peer-to-peer consultation and coaching among NIA staff especially newly hired staff, and by (3) Sending NIA staff to training conducted by other organizations such as the Basic and Advanced Geographical Information System (GIS) training conducted by the National Mapping and Resource Information Authority (NAMRIA) in 2019.

The manuals, guidelines and training materials produced by the project have been utilized by the NIA staff (former project counterparts) as reference in conducting trainings and in revising some of the manuals. One of the products of revisions is the Enhanced FGIS (e-FGIS) which now integrates disaster and climate change information such as areas prone to flashfloods, landslides, and earthquakes. Additionally, most of the former project counterparts sent for training in Japan and Cambodia still work with NIA's O&M system for NIS. Also, most of the main equipment procured by the project are still in good functional status and have been under regular preventive maintenance activities by NIA. Further, 17 of the 18 Regions (NIA Regional offices) have already been provided by NIA central office with FGIS servers, 7 of these servers were procured by the project, while 10 were procured by NIA using its own budget.

<Financial Aspect>

NIA has continuously secured from the central government the necessary budget for its operations including the promotion and dissemination of the improved NIS O&M system introduced by the project.

Budget of NIA

(Unit: million Pesos)

Budget items	2017 (actual)	2018 (actual)	2019 (actual)	2020 (actual)	2021 (planned)	2022 (proposed)
Personal Services (PS)	2,058.47	2,679.55	3,300.99	3,715.91	4,785.72	4,681.33
Maintenance and Other Operating Expenses (MOOE)	1,667.39	1,398.42	2,416.16	4,863.01	3,779.27	2,968.92
Capital Outlay (CO) (billion Pesos)		125.53		87.175	115.33	95.91

Source of funds: General Appropriations Act (GAA)

In addition, NIA has secured a total budget of 589 million pesos for the implementation of FGIS in all 259 NIS nation-wide.

<Evaluation Result>

In light of the above, no problem has been observed in terms of the policy /institutional/organizational / technical / financial aspects. Therefore, the sustainability of the effectiveness through the project is evaluated high.

5 Summary of the Evaluation

The project did not achieve the Project Purpose at the time of project completion, as FGIS was not utilized, Memo circulars issued during that time were limited only to AM, and the capacity of the irrigation stewards have only been partially strengthened. However, all these indicators were achieved after the project was completed, with the Overall Goal fully achieved at the time of ex-post evaluation, as 78 non-pilot NIS have been adopting/implementing improved O&M system introduced by the project, and that the real irrigation areas of NIS, where improved O&M systems introduced, were corrected and validated. As for the efficiency, the project cost exceeded the plan.

Considering all the above points, this project is evaluated to be satisfactory.

III. Recommendations & Lessons Learned

Recommendations for Implementing Agency:

NIA's secured budget of 589 million pesos for the implementation of FGIS in all 259 NIS is only limited to parcellary mapping (※) which was introduced by the project and does not include the system integration of AM and WDD which NIA intends to achieve under its new initiative of Enhanced FGIS, such as map inclusion of areas susceptible to landslides, and making real time information available in cellphones and tablets for ease in monitoring and in making informed decisions on NIA's interventions. Under this circumstance, NIA needs to secure budget for the full implementation of Enhanced FGIS in all NIS nation-wide, which includes AM and WDD-related information and management. In order to do so, NIA needs to prepare annual budget proposals and present to Congress the relevance and urgency of the implementation of Enhanced FGIS to effectively contribute to food security.

Lessons Learned for JICA:

It is important that the activities of the project are directly related to the day-to-day work and mandate of the local counterparts to sustain project effects. In this project, some of the output indicators and the Project Purpose were only partially achieved during project completion. But because the project activities are officially part of the regular tasks of the counterparts, project activities were continued even after project completion resulting to the full achievement of all the indicators of outputs and the Project Purpose at the time of ex-post evaluation.

(※) Parcellary map shows only the property (often for tax mapping purposes) and does not include other features such as AM and WDD which are necessary references for proper O&M of an irrigation facility



NIA Regional Office 3 personnel and farmers discuss about the parcellary map of Pampanga Delta River Irrigation System (PDRIS) as part of Farmland Geographic Information System (FGIS) database development.



NIA Regional Office 1 personnel utilizes the FGIS database in monitoring and updating of operations data (such as planted/harvested area) every cropping season.