Internal Ex-Post Evaluation for Technical Cooperation Project

conducted by Philippines Office: March 2022

Country Name	**Project for Enhancing Capacity on Weather Observation, Forecasting and Warning**
Republic of the Philippines	

I. Project Outline

Background	Every year, the Philippines is exposed to various meteorological disasters, such as typhoons and monsoon rains which bring floods, storm surges, landslides and other natural hazards that cause economic damages and loss of lives. According to the Office of Civil Defense (OCD), 12 tropical storms and typhoons in 2011 alone affected more than 3.5 million people and had caused 1,557 deaths and severe damages to infrastructures, agriculture and people's economic activities. As such, disaster risk management became a critical issue for poverty reduction. In response, JICA implemented a grant aid project, "The Project for Improvement of the Meteorological Radar System" (2009-2014) for the installation of three major doppler radars to provide more accurate typhoon warning signals and typhoon information. However, it was deemed necessary to strengthen the capacity of the staff of the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), an agency responsible for operating meteorological radars and disseminating weather information, on weather observation, forecasting and warning based on the effective use of meteorological radars and on effective dissemination about weather-related information.		
Objectives of the Project	Through implementation of a baseline survey about operation and maintenance status of radars, provision of trainings on calibration, maintenance, operation of an analysis tool for satellite image, weather guidance and others; development of guidelines and manuals on calibration and maintenance; creation of a website and a mobile application to disseminate meteorological information; and planning and implementation of action plans for awareness-raising activities, the project aimed at enhancing the capacity of PAGASA Central Office and Southern Luzon PAGASA Regional Services Division (Southern Luzon PRSD) in terms of weather observation, forecasting and warning, thereby contributing to the enhancement of the capacity of all PAGASA Regional Services Divisions (PRSDs).		
	1. Overall Goal: Capacity of all PAGASA Regional Services Divisions (PRSDs) is enhanced in terms of weather observation, forecasting and warning. 2. Project Purpose: Capacity of PAGASA Central Office and Southern Luzon PRSD is enhanced in terms of weather observation, forecasting and warning.		
Activities of the Project	1. Project site: Metro Manila and Southern Luzon 2. Main activities: 1) Implementation of a baseline survey about operation and maintenance status of radars, 2) Provision of trainings on calibration, maintenance, operation of an analysis tool for satellite image, weather guidance and others, 3) Development of guidelines and manuals on calibration and maintenance, 4) Creation of a website and a mobile application to disseminate meteorological information, 5) Planning and implementation of action plans for awareness-raising activities, etc. 3. Inputs (to carry out above activities) Japanese Side 1) Experts: 13 persons 2) Trainees received: 4 persons 3) Equipment: PC, scanner-printer compound apparatus, projector, etc. 4) Local expense: cost for project activities Philippine Side 1) Staff allocated: 36 persons 2) Land and facility: an office space in PAGASA central office 3) Local expense: utility cost, etc.		
Project Period	(ex-ante) March 2014 – February 2017 (actual) June 2014 – May 2017	Project Cost	(ex-ante) 250 million yen (actual) 256 million yen
Implementing Agency	Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA)		
Cooperation Agency in Japan	Japan Meteorological Business Support Center		

II. Result of the Evaluation

<Constraints on Evaluation>

・ Due to COVID-19 quarantine restrictions, face-to-face interviews and field visits could not be conducted. To address these limitations, questionnaire surveys, telephone interviews and online meetings with former project counterparts were carried out. Phone surveys with non-pilot local governments were also conducted.

1 Relevance

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

The project was consistent with the national development policies of the Philippines such as the "Philippine Development Plan" (2011-2016) aiming at enhancement of monitoring, forecasting, early warning, risk evaluation, and risk management at national and regional levels as one of the strategic frameworks in a national disaster area.

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

The project was consistent with development needs of the Philippines such as to strengthen the capacity of PAGASA's staff on weather observation, forecasting and warning based on the effective use of meteorological radars and on effective dissemination about weather-related information.

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

The project was consistent with the Japan's Country Assistance Program for the Republic of the Philippines (2012) positioned

"overcoming vulnerability and stabilizing bases for human life and production activity" as one of the priority areas.

<Evaluation Result>

In light of 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 achieved by the time of project completion. The average operation rate (i.e. data are provided to PAGASA from radars) of three radars was more than 80% at the time of project completion (Indicator 1). Also, the quantitative forecasting was issued by using weather guidance (Indicator 3). 80% of concerned agencies such as the Municipal Disaster Risk Reduction Management Office (MDRRMO) and the Department of Education who were surveyed agreed that laymanized meteorological information was delivered to them on a timely basis by the time the project was completed (Indicator 3).

<Continuation Status of Project Effects at the Time of Ex-Post Evaluation>

The project effects have been partially continued at the time of ex-post evaluation. Although two radars in Guiuan and Aparri have remained having an operational rate of more than 80%, the operational rate of the radar in Virac declined to 40% since November 2020 due to the damage caused by super typhoon Goni at the same time. Damage assessment was already done by the maintenance service provider in 2021 and repair is expected to take place soon after PAGASA obtain the budget. Quantitative forecasting has been continuously issued by using weather guidance after project completion. Laymanized meteorological information has been delivered on a timely basis to concerned agencies such as the Office of Civil Defense (OCD), the Philippine Coast Guard (PCG) and Local Government Units (LGUs) in project sites even after project completion.

On the other hand, the action plan developed by the project has not been continuously implemented after project completion. Also, the software for radar data calibration with rain gauge data developed by the project has not been utilized after project completion because of the inadequacy of rain gauge data to work on and because the number of rain gauges installed in the Virac radar site was later found to be insufficient to develop the Quantitative Precipitation Estimation (QPE). Because of this reason, PAGASA instead focused on archiving radar data and Automatic Weather Station (AWS) data. Furthermore, the website and the mobile phone application developed by the project have not been continuously operated after project completion as PAGASA later shifted to a more sophisticated Application Programming Interface (API) which does not match with the mobile application developed by the project as it requires major changes in the source code. Nevertheless, PAGASA is currently developing a unified mobile application which hopes to revive the utilization of the mobile application developed by the project. In addition, PAGASA is improving its new website for better use of the general public, aviation and marine industries using local languages. As mentioned above, the software for radar data calibration with rain gauge data, the website and the mobile phone application developed and improved by the project have not been utilized continuously after the project completion. However, PAGASA has been taking actions to continue the project effects by developing systems to replace them. For this reason, the continuation status of indicator 2 and 3 of the Project Purpose at the time of ex-post evaluation was judged as "partially continued".

<Status of Achievement of the Overall Goal at the Time of Ex-Post Evaluation>

The Overall Goal was achieved at the time of Ex-post evaluation. According to the results of the phone interview surveys with representatives of local governments (provinces) in non-pilot areas (16 provinces in North Luzon and 17 provinces in Visayas), more than 80% of the interviewees agree that laymanized meteorological information is timely delivered to them by the PAGASA Regional Services Divisions (PRSD) (Indicator 1). Although some of the project outputs were not continued after the project completion as mentioned above, it seems that this did not affect much the achievement of overall goal because PAGASA took alternative measures to mitigate its negative impacts.

<Other Impacts at the Time of Ex-Post Evaluation>

There have been some positive impacts observed at the time of ex-post evaluation. More people are following warnings of PAGASA especially those located in typhoon-vulnerable areas as evidenced by the various reports of LGUs and the National Disaster Risk Reduction Management Council (NDRRMC) through OCD. Public reception and thrust of PAGASA's services are evidently established firmly as PAGASA continues to provide more articulate weather forecasts and warnings. No negative impact on natural environment was observed.

<Evaluation Result>

In sum, the Project Purpose was achieved, and the project effects were partially continued at the time of ex-post evaluation. Although the software for radar data calibration, the PAGASA website and the mobile phone application developed and improved by the project have not been utilized continuously after the project completion, the Overall Goal was achieved. This ex-post evaluation made an evaluation judgement of effectiveness/impact with more emphasizing on the achievement status of Overall Goal.

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

Achievement of Project Purpose and Overall Goal

Aim	Indicators	Results	Source
(Project Purpose) Capacity of PAGASA Central Office and Southern Luzon PRSD is enhanced in terms of weather observation, forecasting and warning.	Indicator 1 Average operation rate (i.e. data are provided to PAGASA from radars) of three radars becomes more than 80% in the third year.	Status of the Achievement (Status of the Continuation): achieved (partially continued) (Project Completion) • In order to achieve Outputs 2 and 3 of the project, it was necessary to have access to observation data (such as surface observation, AWS, Radar) and incoming data (like satellite data and NWP). As PAGASA already stores such data on their data server, the average operation rate of three radars became more than 80%. (Ex-Post Evaluation) • Two radars in Guiuan and Aparri have remained having an operation rate of more than 80%. However, the operation rate of the remaining radar in Virac declined to 40% since November 2020 because it was damaged by super typhoon Goni in November 2020. • Damage assessment was intermittently conducted by the maintenance service provider in 2021 because of COVID-19	Project Completion Report, Terminal Evaluation Report, Responses to questionnaire from former project counterparts in PAGASA

		pandemic travel restrictions. Repair of the damaged radar is expected to take place soon after PAGASA obtain the budget.	
	Indicator 2 Quantitative forecasting is issued by using weather guidance.	Status of the Achievement (Status of the Continuation): achieved (partially continued) (Project Completion) • Quantitative forecasting was issued by using weather guidance. (Ex-Post Evaluation) • Quantitative forecasting has been continuously issued by using weather guidance after project completion. • In making daily temperature forecast, the operational Temperature Guidance Production System (part of the weather guidance) is used as reference and guide, without which daily temperature forecast could not be delivered. However, this system was originally developed by PAGASA.	Project Completion Report, Terminal Evaluation Report, Responses to questionnaire from former project counterparts in PAGASA
	Indicator 3 More than 80% of concerned actors (i.e. OCD; PCG; LGUs in pilot PRSD) agree that laymanized meteorological information is timely delivered to them in the third year. OCD: Office of Civil Defense PCG: Philippine Coast Guard LGU: Local government unit	Status of the Achievement (Status of the Continuation): achieved (partially continued) (Project Completion) • 24 people out of 30 people of concerned agencies such as Municipal Disaster Risk Reduction Management Office (MDRRMO) and Department of Education marked “Excellent” or “Good” against the question “Do weather information released by South Luzon Province timely?”. (Ex-Post Evaluation) • Laymanized meteorological information has been timely delivered to concerned agencies such as OCD, PCG and LGUs in project sites after project completion. • The new website of PAGASA-enhanced further its contents for better use of the general public, aviation and marine industry. The enhancements include improvements using local language. However, this new website was originally developed by PAGASA.	Project Completion Report, Responses to questionnairefrom former project counterparts
(Overall Goal) Capacity of all PAGASA Regional Services Divisions (PRSDs) is enhanced in terms of weather observation, forecasting and warning.	Indicator 1 More than 80% of LGUs in non-pilot PRSDs agree that laymanized meteorological information is timely delivered to them.	Status of the Achievement: achieved (Ex-Post Evaluation) • According to the interview survey with representatives of the local governments (provinces) in non-pilot areas (16 provinces in North Luzon and 17 provinces in Visayas), more than 80% of the interviewees agree that laymanized meteorological information is timely delivered to them by the PAGASA Regional Services Divisions (PRSD).	Survey results in 33 provinces in non-pilot areas.

3 Efficiency

The project period was within the plan (ratio against the plan: 100%), the project cost slightly exceeded the plan (ratio against the plan: 102%). The outputs were produced as planned. Therefore, efficiency of the project is evaluated fair.

4 Sustainability

<Policy Aspect>

The existing government policies such as “the Philippine Development Plan” (2017-2022), the “National Disaster Risk Reduction and Management Plan” (2011-2028), and the “Climate Change Action Plan” (2011-2028) are supporting the promotion/dissemination of weather monitoring, forecasting, early warning, risk evaluation and risk management.

<Institutional/Organizational Aspect>

PAGASA, which is under the Department of Science and Technology (DOST), is responsible for monitoring meteorological phenomenon and for providing meteorological information. PAGASA is consisted of the Office of the Administrator and 7 Divisions including Weather Division (41 staff) which is responsible for dissemination of forecasting products via all medium and Public Information Unit, Research & Development &Training Division (4 staff) which is responsible for promoting PAGASA’s services. The sufficient number of staff is allocated to continue the project activities such as quantitative forecasting using weather guidance data, making daily temperature forecast using the Temperature Guidance Production System, among others.

<Technical Aspect>

PAGASA sustains skills and knowledge of its staff in promoting/disseminating weather monitoring, forecasting, early warning, risk evaluation and risk management by sending staff to trainings/workshops conducted by other organizations from time to time as well as attending to in-house training and workshops. Most of the staff who were sent to Japan for training during project implementation are still working with PAGASA. They conduct peer-to-peer mentoring and coaching to new staff and share their skills and knowledge. Most of the main equipment such as automatic rain gauges, pressure/de-pressure pump (model VI), digital barometer (3 sensors) necessary to sustain knowledge and skills of staff are still functional and continued to be utilized. The operation and maintenance manuals and guidelines for the weather radar system and other equipment introduced by the project have been utilized.

<Financial Aspect>

PAGASA has continuously secured the necessary budget for promoting or disseminating weather monitoring, forecasting, early warning, risk evaluation and risk management.

Budget for promoting /disseminating weather monitoring, forecasting, early warning, risk evaluation, and risk management targeted by the project

(Unit: in Philippine Peso)

Item	2017	2018	2019	2020	2021

	(Actual)	(Actual)	(Actual)	(Actual)	(Plan)
Personal Services	520,789	519,352	542,997	553,273	605,464
Maintenance and Other Operating Expenses	459,604	470,722	536,092	471,333	549,364
Capital Outlay	2,347,890	1,496,980	567,088	419,955	666,224
Total	3,328,283	2,487,054	1,646,177	1,444,561	1,821,052

<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 project effects is evaluated high.

5 Summary of the Evaluation

The project achieved the Project Purpose which aimed to enhance the capacity of PAGASA Central Office and Southern Luzon Regional Services Divisions (PRSD) in terms of weather observation, forecasting and warning. Also, the continuation status of project effects was partially continued at the time of ex-post evaluation. The Overall Goal which aimed at enhancing the capacity of all other PAGASA PRSDs in terms of weather observation, forecasting and warning has also been achieved. As for efficiency, the project cost slightly exceeded the plan.

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

III. Recommendations & Lessons Learned

Recommendations for Implementing Agency:

- It is recommended that PAGASA clarify the cost estimates for the repair of damaged radar in Virac, coordinate repair schedules with the maintenance service provider and conduct the necessary repair activities on site but should be compliant with the health protocol standards implemented by the central and local governments

Lessons Learned for JICA:

- In this project, some of the project outcomes such as the software for radar data calibration with rain gauge, the action plan, the website and the mobile phone application have not been utilized after project completion. To ensure continued usability and workability of project products such as data calibration software, it is important to conduct first a complete assessment on the availability of necessary components such as sufficiency of rain gauges to collect rainfall data before developing the software.

Japanese expert conducting training on temperature guidance to PAGASA counterparts

An Automatic Rain Gauge equipment installed for radar calibration and quantitative precipitation estimation