Ex-Post Project Evaluation 2013: Package I-7 (the Philippines)

September 2014

JAPAN INTERNATIONAL COOPERATION AGENCY

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Preface

Ex-post evaluation of ODA projects has been in place since 1975 and since then the coverage of evaluation has expanded. Japan's ODA charter revised in 2003 shows Japan's commitment to ODA evaluation, clearly stating under the section "Enhancement of Evaluation" that in order to measure, analyze and objectively evaluate the outcome of ODA, third-party evaluations conducted by experts will be enhanced.

This volume shows the results of the ex-post evaluation of ODA Loan projects that were mainly completed in fiscal year 2011, and Technical Cooperation projects and Grant Aid projects, most of which project cost exceeds 1 billion JPY, that were mainly completed in fiscal year 2010. The ex-post evaluation was entrusted to external evaluators to ensure objective analysis of the projects' effects and to draw lessons and recommendations to be utilized in similar projects.

The lessons and recommendations drawn from these evaluations will be shared with JICA's stakeholders in order to improve the quality of ODA projects.

Lastly, deep appreciation is given to those who have cooperated and supported the creation of this volume of evaluations.

September 2014
Toshitsugu Uesawa
Vice President
Japan International Cooperation Agency (JICA)

Disclaimer

This volume of evaluations, the English translation of the original Japanese version, shows the result of objective ex-post evaluations made by external evaluators. The views and recommendations herein do not necessarily reflect the official views and opinions of JICA. JICA is not responsible for the accuracy of English translation, and the Japanese version shall prevail in the event of any inconsistency with the English version.

Minor amendments may be made when the contents of this volume is posted on JICA's website.

JICA's comments may be added at the end of each report when the views held by the operations departments do not match those of the external evaluator.

Republic of the Philippines

Ex-Post Evaluation of Japanese Grant Aid Project
"The Project for Improvement of Flood Forecasting and Warning System in the Pampanga and Agno River Basins"

External Evaluator: Kenichi Inazawa, Octavia Japan Co., Ltd.

0. Summary

With an aim to improve the function of flood forecasting and warning system (hereinafter referred to as "FFWS"), this project enhanced FFWS related facilities and procured and installed materials and equipment in Pampanga and Agno River Basins located in the Central Luzon Region. At the time of the ex-post evaluation, this project is in line with the policy such as "the Mid-Term Philippine Development Plan" and the development needs to further improve FFWS; thus relevance is high. Through this project, the missing rate of data collection in the telemetry system and the observation time for FFWS improved mostly as planned. In addition, interviews with the local government agencies and towns/villages (barangays) confirmed that FFWS developed by the project was transmitting accurate rainfall and water-level information to the relevant agencies and securing sufficient time for evacuation (lead time) at times of floods. Thus effectiveness and impact is high. Although the project cost was within the plan, the project period exceeded the plan; thus efficiency is fair. On the other hand, problems were not observed in the institutional, technical and financial aspects of PAGASA, the implementing agency; thus sustainability is high.

In light of the above, this project is evaluated to be highly satisfactory.

1. Project Description

Project Location

Rehabilitated Agno Sub Center

1.1 Background

In Pampanga and Agno River Basins located in the Central Luzon Region, infrastructure

development such as highway constructions is advanced, and the population is growing rapidly in recent years. The FFWS[1] of the two river basins was more than 20-30 years old; facilities such as rainfall and water-level gauging stations across the river basins were deteriorating. In addition, the two river basins were devastated by a number of natural disasters, including volcanic mudflow caused by the eruption of Mount Pinatubo, earthquakes in and around Baguio of the Cordillera Administrative Region and frequent typhoon occurrences (3-5 times a year on average) in the 1990s. For example, a large amount of collapsed sediment and volcanic sediment flew into the river, and sediment accumulated in the river channels. As a result, riverbeds rose and caused bank collapses in midstream and expansion of flood areas and prolongation of inundation period in downstream. Additionally, after the rise in riverbeds in the 1990s, the flood risk was increasing in the area. Out of the fifteen water-level gauging stations that existed, there were difficulties in measuring accurate water levels at eleven stations. Therefore, there was an urgent need to rehabilitate/improve/enhance the FFWS in both of the river basins with a view to providing accurate flood information to the residents.

1.2 Project Outline

The objective of this project is to improve the function of FFWS by replacing non-operational FFWS facilities/putting-up additional monitoring stations/improvement of backbone for telecommunication, thereby contributing to the prompt and precise information dissemination to the residents in the river basins and to the realization of safe evacuation in Pampanga and Agno River Basins in the Central Luzon Region.

Grant Limit / Actual Grant Amount	1,155 million yen (The 1st phase: 779 million yen, the 2nd phase: 376 million yen) / 1,055 million yen (The 1st phase: 730 million yen, the 2nd phase: 325 million yen)
Exchange of Notes Date (/Grant Agreement Date)	The 1st phase: July 2007 The 2nd phase: October 2008
Implementing Agency	Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA)

[1] How flood forecasting and warning works is that, PAGASA, the implementing agency of this project, predicts what scale of flood is likely to occur in different area based on predicted rainfall, observed rainfall, observed water level and predicted typhoon routes and issues flood bulletins to the local government agencies within the concerned river basins.

Project Completion Date	February 2011 (The 1st phase: March 2009, the 2nd phase: February 2011)
Main Contractor	Toyota Tsusho Corporation
Main Consultant	Nippon Koei Co., Ltd.
Basic Design	October 2006 – March 2007
Detailed Design	N/A
Related Projects	【Technical Cooperation Projects】 ・"Flood Forecasting and Warning Service Strengthening Guidance Project" (2004-2006) ・"The Project for Strengthening of FFWS for Dam Operation" (2009-2012) ・Experts Dispatched (8 persons in total, 2004-2006) ・Counterpart Training (5 persons in total, 2005) 【Grant Aid Projects】 ・"The Project for Establishing Pampanga River Basin FFWS" (1973) ・"The Project for Improvement of FFWS in the Pampanga River Basins" (1981) 【ODA Loan (JICA Loan)】 ・"FFWS for Dam Operation Project" (The loan agreement was signed in 1982) ・"Agno and Allied Rivers Urgent Rehabilitation Project" (The loan agreement was signed in 1995) ・"Agno River Flood Control Project (II) and (II-B)" (The loan agreement was signed in 1998 and 2001 accordingly)

2. Outline of the Evaluation Study

2.1 External Evaluator

Kenichi Inazawa, Octavia Japan Co., Ltd.

2.2 Duration of Evaluation Study

Duration of the Study: November 2013–September 2014

Duration of the Field Study: January 19–February 1, 2014, April 20–26, 2014

3. Results of the Evaluation (Overall Rating: A[2])

3.1 Relevance (Rating: ③[3])

3.1.1 Relevance to the Development Plan of the Philippines

Before the project commencement, the Philippine government formulated the "Mid-Term Philippine Development Plan" (2004-2010). In this plan, disaster reduction was identified as an important issue, along with the strengthening of disaster prevention organizations and FFWS. Additionally, in the "National Science and Technology Plan", which was formulated with the aim of improving the science technology capability with a target year of 2020, improvement of disaster prevention function with the utilization of scientific technologies was identified as an important task.

At the time of the ex-post evaluation, the government formulated the "Philippine Development Plan" (2011-2016). This plan recognizes that climate change and its effects on natural disasters will lead to more poverty and environmental degradation. Based on such understandings, the government enacted the "Disaster Risk Reduction and Management Council Act" (Republic Act No. 10121) in 2010, emphasizing "the importance of establishing a framework for the national disaster risk reduction efforts" by using integrated methods to manage natural and human disasters. This act recognizes that Early Warning System (EWS) plays an important role in enhancing local communities' resilience against disasters and in strengthening their abilities to respond to disasters.

In light of the above, it can be considered that disaster prevention and response in the Philippines are consistent with the policy such as the national and sector plans, before the project commencement as well as at the time of the ex-post evaluation.

3.1.2 Relevance to the Development Needs of the Philippines

Japan has been providing assistance concerning FFWS to the Philippines since the 1970s. With regard to Pampanga and Agno River Basins, Japan has developed FFWS, piloted projects and rehabilitated existing equipment through ODA loans and grant aid projects thus far. At the time of the ex-ante evaluation, FFWS of the two river basins was already operating for more than 20-30 years old. The facilities were deteriorating severely, which contributes to the

[2] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory
[3] ③: High, ②: Fair, ①: Low

difficulties in accurately measuring water levels at eleven water-level gauging stations out of the fifteen that existed. In addition, the existing backbone multiplex radio network, which connects the gauging stations and regional monitoring offices (hereinafter referred to as "sub centers") to the central monitoring center located in Manila, was unstable due to frequent network interruption by mobile phone interference. Thus real-time monitoring or prompt and accurate transmission of flood related data was intermittent at the central monitoring center (though at the Sub-Center, data were being transmitted). As a result, there was difficulty in providing timely and appropriate information to the local residents, and there was a concern that evacuation activities would be prolonged, inflicting further damage. Therefore, it was highly necessary to improve the FFWS in both areas.

At the time of the ex-post evaluation, the Philippine Atmospheric, Geophysical and Astronomical Services Administration (hereinafter referred to as "PAGASA"), which is the implementing agency of this project, is considering the introduction of FFWS to other major river basins[4] in the Philippines. This reflects PAGASA's direction toward disaster risk reduction. Given the situations of the Philippines concerning flood forecast and warning, JICA is also conducting a basic information gathering survey[5] on flood forecasting and warning covering the entire Philippines, with the objective of identifying needs for future assistance, including a possibility of applying Japan's state-of-the-art technologies related to flood forecasting and warning.

In light of the above, need for FFWS development continues to be placed an importance. Therefore, the project is considered to be consistent with the development needs before the project commencement as well as at the time of the ex-post evaluation.

3.1.3 Relevance to Japan's ODA Policy

The Country Assistance Plan for the Philippines, which was developed by the Ministry of Foreign Affairs of Japan in 2000, identified the following priority areas and sector assistance policy: (1) "strengthening the economy and overcoming growth constraints toward sustained economic growth"; (2) "rectification of disparities (alleviating poverty and redressing regional disparities)"; (3) "environmental protection and anti-disaster measures"; and (4) "human resources development and institution building". With regard to (3), it is stipulated that "because

[4] The other thirteen major river basins are Abra and Abulug (Luzon), Panay, Jalaur and Ilog-Hilabangan (Visayas), Agusan, Agus-Lanao Lake, Buayan-Malungon, Cagayan de Oro, Mindanao/Cotabato, Davao, Tagoloan and Tagum-Libuganon (Mindanao). The river basins in which FFWS has already been established are Agno, Bicol, Cagayan, Marikina and Pampanga (5 in all), all located in the Luzon Region.

[5] It was completed in September 2013.

frequent large-scale natural disasters constrain development, and also tend to impact more heavily on the poor, we will continue to provide aid for flood and sand control and earthquake-related measures, while also assisting in developing the necessary systems and capacity in related government institutions from a medium- to long-term perspective." This project aimed to strengthen the disaster prevention function of the Philippines and is in line with the above priority and sector assistance policy (environmental protection and anti-disaster measure). Therefore, it is consistent with the assistance policy of Japan.

This project has been highly relevant to the Philippine's development plan, development needs, as well as Japan's ODA policy. Therefore its relevance is high.

3.2 Effectiveness[6] (Rating: ③)

3.2.1 Quantitative Effects (Operation and Effect Indicators)

Through this project, it was aimed that the missing rate of data collection in the telemetry system would improve from 50% to 3.6% and the observation time would reduce to about 10 minutes for the FFWS in Pampanga and Agno River Basins by procuring and installing new telemetering equipment for rainfall and water-level gauging stations and data processing. Table 1 shows the target and actual data before the project commencement and after the project completion.

Table 1: Changes in the Missing Rate of Telemetry Data Collection and the Observation Time

Output Indicator	Before Project Commencement		After Project Completion			
	Actual (2007)	Target After Project Completion (2010)	2010	2011	2012	2013
1) Missing rate of data collection in the telemetry system	50%	3.6%	Approx. 3.0%	Approx. 2.7%	Approx. 0.3%	Approx. 1.2%
2) Observation Time[7]	About 2 hrs	About 10 min	About 5-10 min			

Source: JICA document (at the time of the ex-ante evaluation), answers to the questionnaire (at the time of the ex-post evaluation)

1) Missing Rate of Data Collection in the Telemetry System

As shown in Table 1, the missing rate of data collection in the telemetry system was expected

[6] Sub-rating for Effectiveness is to be put with consideration of Impact.

[7] It refers to the minimum time required for the telemetry observation system to collect data automatically.

to become 3.6% after the completion of this project. According to JICA document, this target was set with the understanding that "it might become impossible to collect data at one station due to flood damage (i.e., 3.6%), although the missing rate could become almost 0% in theory after the improvement (of the FFWS with the procurement of equipment and devices by this project)." In 2010 some data was missing[8] because the sensor signal cable, which had been installed at Mayapyap rainfall gauging station, was stolen. In 2011, the recovery work which began in 2010 was still on-going at Mayapyap rainfall gauging station, while sensor signal cables were also stolen at Peñaranda and Arayat rainfall gauging stations, resulting in missing data[9]. In 2012 the recovery work for Arayat rainfall gauging station still continued, resulting in missing data[10]. In July 2013, a sensor signal cable of Mayapyap rainfall gauging station was vandalized and immediate repair was undertaken. During the occurrence of typhoon in October 2013, the antenna tower of Mayapyap station was damaged, resulting in missing data[11]. Based on the above, the missing rates were within the initial target although some data was missing each year; thus it can be said that FFWS telemetry observation system is generally functioning well. With regard to the ways in which the Philippine side is addressing the theft of sensor signal cables, it will be discussed in the "Status of Operation and Maintenance" below.

2) Observation Time

Before the project commencement, data collection normally took about 2 hours. This is mainly because data had to be measured visually due to the failure of the telemetry observation system. Through this project, the accuracy of rainfall and water-level measurement was expected to improve, and the observation time was expected to reduce greatly (from about two

[8] It was stolen in March 2010, and the recovery work was completed in March 2011. In other words, in the year of 2010, data could not be collected from March to December for roughly 10 months at this station. Thus the missing rate is calculated to be approximately 3.0% (=3.6% x 10months / 12 months).

[9] In 2011 (1) the missing rate was approximately 0.9% (= 3.6% x 3 months / 12 months) at Mayapyap rainfall gauging station due to the recovery work which was carried out from March 2010 to March 2011 following the theft; (2) the missing rate was approximately 0.3% (3.6% x 1 month / 12 months) at Penaranda gauging station due to the theft in May as a result of which recovery work continued until the end of June, leading to about one month of missing data from May to June; and (3) there were incidences of theft at Arayat gauging station in August and December. The recovery work for the theft in August was completed in November, while the recovery work for the theft in December was completed at the end of January 2012, making the data missing period five months (from August to December); thus the missing rate can be calculated to be approximately 1.5% (= 3.6% x 5 months / 12 months). Based on the above, the total missing rate of data collection adds up to approximately 2.7% (0.9 + 0.3 + 1.5%).

[10] Because the sensor signal cable was stolen at Arayat gauging station in December 2011, the recovery work continued until the end of January 2012. As there is about one month of data missing period in the year of 2012, the missing rate is calculated to be approximately 0.3% (= 3.6% x 1 month / 12 months) for 2012.

[11] The recovery work is not progressing at the time of the ex-post evaluation (January 2014). However, PAGASA is procuring heavy machinery and following up on the approval of the fund for the recovery work. The data missing period is roughly four months (from September to December), and the missing rate of data collection is calculated to be approximately 1.2% (= 3.6% x 4 months /12 months).

hours to 10 minutes). Through the interviews with PAGASA staff members conducted as part of this evaluation study, it has been confirmed that the observation time is now roughly 5-10 minutes mainly because the telemetry observation systems were renewed by this project. Therefore, it can be said that the target has also been achieved in terms of observation time.

Photo 1: Constructed Pampanga Sub Center

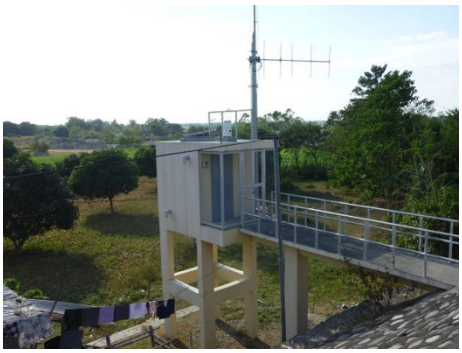
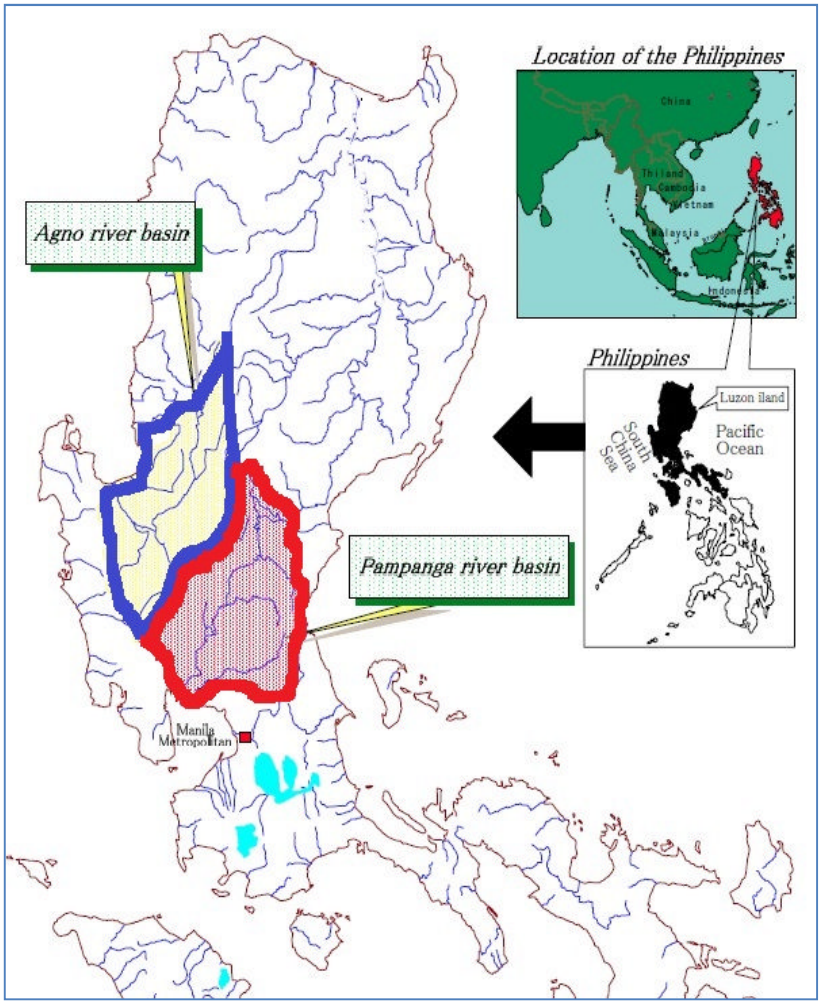


Photo 2: Developed Rainfall Gauging Station (Santa Maria, Agno River Basin)



Source: JICA document

Figure 1: Locations of Project Sites

3.2.2 Qualitative Effects

1) Stabilized Telemetry System Operation

At the time of the ex-post evaluation, the telemetry observation facilities newly procured and installed by this project are functioning well without failure or problem. Through the interviews with the staff of Pampanga and Agno Sub Centers and PAGASA headquarters and through site visits, it has been confirmed that neither malfunctioning nor deterioration of data accuracy was observed. According to the staff interview, the following comment was received: “We can prevent troubles related to the procured and installed facilities by carrying out our day-to-day work carefully. By doing so, we can also improve durability of the facilities.” Considering such a comment, it can be judged that with continuous and proper maintenance the operation has stabilized as compared to before the project commencement.

2) Improved Operational Technology and Management of PAGASA Staff

As part of the soft-component training (technical assistance), training was held for Telecom Engineers/Technicians and Hydrologists in operation and maintenance of FFWS, outflow forecasting technologies and over flood analysis technologies. According to the interviews with training participants, they commented, “The content of the training was useful. In some occasions we utilize what we learned during the training, and it is giving us more confidence in what we do.” It can be judged that participants learned sufficient knowledge and technologies concerning operation and maintenance of software for outflow forecasting and over flow analysis through the training. In addition, PAGASA has a plan to organize internal training for other staff members. Therefore, it can be judged that knowledge of the staff will continue to improve and be accumulated.

3.3 Impact

3.3.1 Intended Impacts

3.3.1.1 Contribution to the Prompt and Accurate Dissemination of Flood Forecasting and Warning Information to the Residents and the Realization of Safe Evacuation

1) Prompt and Accurate Dissemination of Flood Forecasting and Warning Information to the Residents

PAGASA’s information transmission of FFWS begins by predicting rainfall, water levels, typhoon routes and flood scales. Based on such prediction, PAGASA prepares a flood bulletin and alerts institutions that are managing dams in the river basins (the National Irrigation Administration or the National Power Corporation), local government agencies (Local

Government Units and Provincial Disaster Risk Reduction and Management Offices), the Office of Civil Defense (OCD)[12], the media and so on. Then, residents in the affected river basin can obtain flood forecasting and warning information through the public wireless broadcasting (disaster prevention public wireless broadcast) by the Local Government Units and Provincial Disaster Risk Reduction and Management Offices, from the media such as radio and from internet. The number of people who can receive flood forecasting and warning information (i.e., beneficiaries of this project) is estimated to be approximately 7-8 million[13] in Pampanga River Basin and 3-4 million[14] in Agno River Basin (calculated based on the population data of 2010).

As a result of the interviews with local government agencies in Pampanga and Agno River Basins concerning the FFWS developed by this project, the following comments were received from various sectors. It can be observed that precise information such as rainfall and river water level is being disseminated to the concerned agencies in an accurate and prompt manner and such information is being utilized effectively.

Box 1. Results of Interviews with Relevant Local Government Agencies

■ The National Irrigation Administration (NIA), which operates Pantabangan Dam located upstream in Pampanga river, commented in interview, "Before the project commencement, we used to rely on radio broadcasting for flood forecasting and warning. At that time mobile phones were not as widespread as they are now; and it was not easy to promptly obtain accurate information. As a result of the development of FFWS through this project, information on rainfall and river water level is instantly provided to the residents, farmers, Local Government Units and the Office of Civil Defense. In other words, people are now able to obtain information at all times and know when to evacuate. They can utilize data any time. We consider this to be a big change."

■ The Provincial Disaster Risk Reduction and Management Office (PDRRMO) of Bulacan and Pampanga Provinces commented in interview, "Although we do not have too many actual cases as there has not been heavy rain or flood of large scale in the past few years, we trust

[12] It is a governmental organization mandated to reduce and manage disaster risks. In the Philippine the "Disaster Risk Reduction and Management Act (DRRM Act)" (Republic Act No. 10121) was enacted in May 2010. With a view to managing disaster risks in a more comprehensive manner by incorporating prevention and reduction to the conventional post disaster responses, the act stipulated a fundamental framework for disaster prevention based on a new approach called disaster risk reduction and management. The National Disaster Risk Reduction and Management Council (NDRRMC) has been established by the DRRM Act as the highest decision making body related to national-level disaster management. The OCD serves as the administrative body of the NDRRMC.

[13] It was estimated based on the combined population of Nueva Ecija Province, Pampanga Province, Bulacan Province and a part of Tarlac Province.

[14] It was estimated based on a part of Benguet Provice, Pangasinan Province and a part of Tarlac Province.

river water-level and rainfall data managed by PAGASA. Flood-related information sent from PAGASA is useful in informing the residents about evacuation routes and places. That is to say, it enables us to smoothly conduct evacuation management in times of flood."

■ As a result of the interview with a barangay managing a community tends to experience relatively severe flood in Pampanga River Basin, they commented, "We think that nowadays there is sufficient lead time in case of evacuation caused by flood. Residents normally need substantial time to take valuables from their houses; and the current lead time is sufficient. Before (the implementation of this project), it took time to acquire information on rainfall and river water-levels. The communication and collaboration among the concerned institutions were not necessarily satisfactory, either. At present, however, the reliability has improved partly because of the development and improvement of the equipment system. Additionally, it is also valuable that one can access rainfall and water-level information provided by PAGASA using internet such as Social Networking Service (SNS)[15].

To take Pampanga River Basin as an example, after the project completion, a total of 18 flood bulletins were issued for Typhoon Pedring and Typhoon Quiel in 2011. In August 2012 when the area was hit by heavy rain, a total of 22 flood bulletins were issues. It can be observed that, after this project the arrival time of flood is more accurately cited in the bulletin today as compared to before the project commencement. This presumably explains the above positive comments from various sectors[16].

2) Contribution of Hazard Map Development to the Realization of Safe Evacuation

The Local Government Units of Pampanga and Bulacan Provinces visited during this evaluation study have been preparing hazard maps[17]; thus the FFWS developed by this project is contributing to the preparation of more precise hazard maps. According to the interviews with the Provincial Disaster Risk Reduction and Management Office of both provinces, they commented, "For example, by informing each Local Government Unit about rainfall and river water-levels accurately and promptly, we are able to provide more concrete information than

[15] The interviewed barangays have dedicated staff to monitor rainfall and water-level data provided by Pampanga Sub Center located upstream. By utilizing such data, they provide information like evacuation time to the local residents.

[16] In addition, it was observed through the interviews that PAGASA and relevant agencies have improved their cooperation.

[17] In fact, after the establishment of the "Philippine National Disaster Risk Reduction and Management Council Act" (Republic Act No. 10121) described in "Relevance to the Development Plan of the Philippines" under Relevance, local government units are making efforts to develop hazard maps as per this law.

before, such as areas in which area flood is likely to occur, when the water level is likely to be high and different routes to evacuation places." In addition, the above-mentioned barangay that was visited during the evaluation study, is organizing advocacy seminars concerning flood hazard maps for local residents a few times a year[18]. They are working toward safer evacuation by giving lectures on how to utilize flood hazard maps, guidance on evacuation routes and how to respond to floods. Considering such cases, coupled with the development of FFWS by this project, it can be presumed that efforts are being made toward safe and prompt evacuation with the utilization of flood hazard maps in both provinces at the community level in the both river basins.

Photo 3: PAGASA Headquarters (Hydrometeorological Division)

Photo 4: Flood Caused by Heavy Rain in August 2012 (Pampanga Province)

3.3.2 Other Impacts

3.3.2.1 Impacts on the Natural Environment

The environmental and social aspects that had been considered concerning this project were water-level gauging stations to be established along the rivers and rainfall stations to be established within the premises of schools and government agencies, etc. It was considered that these facilities would not have any negative impact on the environment and society, such as impacts on nature and resettlement. Thus the implementation of the Environmental Impact Assessment (EIA) was not required. PAGASA obtained a certificate of non-coverage that the EIA was not necessary for the facilities to be constructed from the Department of Environment and Natural Resources (hereinafter referred to as "DENR") before the project commencement.

It has been confirmed through the interviews with staff of PAGASA headquarters as well as Pampanga and Agno Sub Centers that no environmental problem (noise, air pollution, dust

[18] According to PAGASA, although the exact number or the contents of activities are unknown, barangays other than the one that was visited are also conducting similar advocacy seminars and that they tend to be located in areas likely to be more affected by flood within Pampanga and Agno River Basins.

generated by passing vehicles, etc.) was observed within the project sites during the project implementation as well as after the project completion.

There has not been any particular need for environmental monitoring on the facilities and equipment developed by this project after the project completion. Neither PAGASA nor its supervising ministry, the Department of Science and Technology (DOST), has an established structure for environmental monitoring. According to PAGASA, in case any negative environmental problem occurs, DENR will first look into the fact and try to address the issue[19].

3.3.2.2 Land Acquisition and Resettlement

Resettlement was not required in this project. On the other hand, some land became subject to acquisition for the construction of Pampanga Sub Center and rainfall gauging station. Since much of the land was originally owned by the government (state-owned land), PAGASA was able to proceed with the acquisition smoothly by discussing with local government unit. With regard to the land for the telecommunication steel tower, it was also owned by the government (the National Irrigation Administration (NIA), the National Power Corporation (NPC) and the National Grid Corporation of the Philippines (NGCP)). Thus the procedure went smoothly without any particular problem.

This project has largely achieved its objectives. Therefore its effectiveness and impact is high.

3.4 Efficiency (Rating: ②)

3.4.1 Project Outputs

Table 2 shows the planned and actual outputs of this project.

Table 2: Planned and Actual Outputs of this Project[20]

Plan (Before Project Commencement)	Actual (At the Time of Ex-Post Evaluation)
【Planned Inputs from the Japanese Side】	【Actual Inputs from the Japanese Side】

[19] However, the reason why they do not have any established monitoring structure is probably because they have not had any actual cases and problems have not occurred until the time of the ex-post evaluation.

[20] The names of the project components borne by the Japanese side differ between the plan (left-hand column) and the actual (right-hand column) because the project was implemented in two phases and the completion reports submitted by the main consultant had different names.

1) Civil work (new gauging stations) - Renewal and addition of telemetry observation systems: 28 stations in total 2) Civil work (other construction work at the gauging stations) - Embankment works: 2 sites - Office construction: 15 gauging stations - Water level gauge support works: 12 gauging stations 3) Installation and adjustment of equipment (all stations) -Renewal of telemetry observation systems: 1 new gauging station and 2 renewed gauging stations - Renewal and establishment of multiplex-radio system: 7 links of 7.5GHz band, 2 links of 18GHz band (out of which 1 link of 18GHZ band is to be newly established) - Renewal and new establishment of facilities at relevant agencies (equipment for the agencies working in disaster prevention by collaborating with PAGASA, such as the Department of Public Works and Highways, the National Power Corporation and National Irrigation Administration and their respective dam sites and Office of Civil Defense): 5 renewals and 2 new sites 4) Steel tower construction (all constructions including new and reinforcement) - 4 new constructions and 4 reinforcement sites 5) Equipment removal - one set * Transfer of technology to enable smooth operation and maintenance of the above (soft	(Phase I) 1) Telemetry subsystem[21] (a) Rainfall gauging station: 4 new constructions and 3 renewals (b) Rainfall and water-level gauging stations: 2 new constructions and 8 renewals 2) Data processing subsystem[22] (a) New construction of monitoring center: 1 site (b) Renewal of central monitoring center: 1 site (c) Renewal of disaster prevention agencies: 4 sites (d) Renewal of dam sites : 3 places 3) Backbone multiplex radio network subsystem[23] (7.5GHz: 5 sections, 18GHz: 2 sections) 4) Communication antenna tower (3 new construction and 3 renewals) 5) Civil works (embankment works at 2 places, construction of 9 station buildings and supporting works for water level sensors at 7 places) (Phase II) 1) Telemetry subsystem (a) Rainfall gauging station: 3 new constructions (b) Rainfall and water-level gauging stations: 3 new constructions and 5 renewals 2) Data processing subsystem (a) New construction of monitoring center: 1 site (b) Renewal of central monitoring center: 1 site 3) Backbone multiplex radio network subsystem (7.5GHz: 2 sections) 4) Communication antenna tower (1 new construction) 6) Civil works (embankment works at 2 places, construction of 7 station buildings and supporting works for water level sensors at 6 places) * The soft component listed on the left-hand column was implemented as planned.

[21] It measures rainfall and water-level data at the station and transmits it to the repeater station through 150 MHz band radio channels.

[22] It collects and saves the observation data, monitors at monitoring centers (data information centers and sub centers) and provides information to the relevant agencies and dam sites.

[23] It is a radio system used to transmit observation and voice data (Voice over IP) using 7.5GHz and 18GHz bands.

component) ・Technical support for the operation and maintenance ・Technical support for the outflow forecasting and overflow analysis 【Planned Inputs from the Philippine Side】 1) Construction of Pampanga Sub Center building 2) Rehabilitation of the Agno Sub Center, including the construction of additional floor/level of the building 3) Permission to use frequencies and communication equipment 4) Strengthening of operation and maintenance capability 5) Restoration or repair of existing facilities 6) Removal or reuse of existing facilities and equipment 7) Coordination and securing permission from LGUs, government, including schools, and private entities where stations and communication towers will be established, including the schedule of project implementation to ensure that there will be no interruptions of their activities 8) Securing VAT budget 9) Licensing and securing approval/ permission for cutting trees near the site, land acquisition, Height Clearance Permit, required permits from the concerned Local Government Units prior to the start of construction, etc.) 10) Other procedures (provision of temporal storage space for equipment and processing of the permission for antenna tower construction) 11) Construction of new Repeater Equipment/DEG Room at Cuyapo Repeater site	【Actual Inputs from the Philippine Side】 The outputs on the left-hand column were delivered almost as planned.

Source[24]: JICA document (The names of the planned items were mostly taken from the Basic Design Study Report of the project, while names of the actual items were taken from the completion reports.)

The outputs from the Japanese and Philippine sides were implemented almost as initially

[24] The information on outputs "before the project commencement" was taken from the Basic Design Study Report, while the information on outputs "after the project completion" was taken from the project completion reports. This is why the terms and the list differ between the left- and right-hand columns. (It was difficult to list them in a strictly consistent manner because the former lists information concerning the entire plan, while the latter lists information based on the construction phase (Phase I and Phase II).)

planned. On the other hand, there are some disparities as described below. The main reason is that some changes were made at the time of the detailed design.

① Construction of Station Buildings (15 stations were planned but 16 were actually constructed) and Construction of Steel Tower (4 places were planned to be renewed but 3 were actually renewed)

Initially, it was planned to establish 7.5 GHz multiplex-radio system connecting "Rosales (Agno Sub Center) – Tarlac (Ultra High Frequency (hereafter referred to as "UHF") repeater station) – Cabanatuan (existing UHF radio repeater station)" with the aim of utilizing FFWS facilities at Agno Sub Center. This plan included the construction of telecommunication steel towers: the existing 28m tower was to be changed to a new 35m tower in Rosales; the existing tower was to be changed to a new tower in Tarlac; and a new 35m steel tower was to be constructed in Cabanatuan. However, at the time of the detailed design it was found that a small airport[25] existed near Rosales, and the project could not obtain permission for the construction of a steel tower in Rosales from the aviation authority. The new repeater station was thus decided to be constructed in Cuyapo, a short distance away from Rosales. The multiplex-radio system was thus actually established connecting "Rosales – Cuyapo (new repeater station) – Cabanatuan." As a result of this change in the detail design, it became unnecessary to construct towers in Rosales and Tarlac (2 stands), while the need arose to construct a new station building and a steel tower (20m, 1 stand) in Cuyapo[26].

② Water Level Gauge Support Works (12 places were planned but 13 were actually constructed)

The initial plan was to put one water-level gauge at Agno Sub Center. During the project implementation, however, it was found that the water level could reach up to the second floor of the center in case of flood. Hence, 2nd floor of the building was added/constructed to ensure that new equipment that will be provided by the Project will be protected in the event that high flood waters will inundate the area.

③ Construction of Data Processing Sub System (1 new establishment was planned, but 2 new systems were established in reality)

Before the project commencement, Pampanga Sub Center was located inside PAGASA' headquarters (Quezon City) in Manila. However, with a view to making their work closer and more relevant to the community, it was decided at the time of the detailed design that the sub center should be constructed in Pampanga Province. Following this decision, it was also decided to establish a data processing sub system inside the new sub center. (In other words, Pampanga Sub Center became a subject for data processing sub system in addition to Agno Sub Center.)

[25] However, the airport has not been in use since then up to today.
[26] According to the interview with the main consultant, the construction cost was cheaper for the station building and steel tower in Cuyapo than for the steel towers in Rosales and Tarlac.

Photo 5: Data Processing System inside Agno Sub Center

Photo 6: Constructed Telecommunication Steel Tower

3.4.2 Project Inputs

3.4.2.1 Project Cost

The total project cost was initially planned to be 1,216 million yen (out of which 1,155 million yen was to be borne by the Japanese side, while roughly 61 million yen was to be borne by the Philippine side). The actual project cost was roughly 1,129 million yen (out of which 1,055 million yen was borne by the Japanese side, while roughly 74 million yen was borne by the Philippine side), which was lower than planned (93% of the plan). The project cost borne by the Japanese side was roughly 100 million yen less than what was planned because the project managed to reduce cost by applying competitive bidding, a cost efficient method. On the other hand, the project cost borne by the Philippine side was higher than planned. It is mainly because there was disparity between the actual VAT amount and the estimated amount[27].

3.4.2.2 Project Period

The project period was planned to be 2 years and 8 months (32 months) from July 2007 to February 2010. In reality it took 3 years and 8 months (46 months) from July 2007 to April 2011, with a delay of about 14 months. The main reasons for the delay are as the following: (1) the project was not successful in selecting a bidding winner for equipment procurement the first time, and it had to be re-announced and required long time to identify a supplier; and (2) as described above, a change was made at the time of the detailed design in relation to the construction of station building and steel towers. As a result, the cost had to be recalculated, and

[27] In principle, VAT applies to construction works and purchasing of materials and equipment in the Philippines. The amount of VAT required for this project was underestimated because before the project commencement the austerity measures were in place by the administration at that time (the Arroyo administration). As the actual VAT expended was more than the initial estimate, it created the disparity.

it required time to discuss the recalculated cost with PAGASA and also to follow through the procedures necessary for making changes to the project.

Although the project cost was within the plan, the project period exceeded the plan. Therefore efficiency of the project is fair.

3.5 Sustainability (Rating: ③)

3.5.1 Institutional Aspects of Operation and Maintenance

The main activities of PAGASA include meteorological observation, communication and analysis as well as other related research and advocacy. The supervising ministry of PAGASA is the Department of Science and Technology (DOST), and it has a total of 881 staff members (as of September 2013). In fact, the number of staff has reduced from 1,122 which was before the project commencement (2005). It is because of the rationalization plan which was implemented in 2008-09, which encouraged early retirement, froze new recruitment and reshuffled existing staff within the organization. According to the interviews with the management of PAGASA, they commented, "Although the number of staff members has reduced, we are optimizing our work by placing the right people in the right places. We also have sufficient number of staff assigned for the operation and maintenance works."

It is the Hydrometeorological division (hereinafter referred to as "HMD") that is responsible for flood forecasting and warning within PAGASA. HMD collects and analyzes flood-related data such as rainfall and water levels, manages database, forecasts floods, transmits flood information and maintains telemetry equipment. HMD has a total of 49 staff members (as of September 2013). On the other hand, it is the sub centers (4 centers in total[28]) that are observing floods and operating gauging stations in the regions. Each sub center closely works with HMD and provides flood-related information to the local governmental agencies and media. Table 3 shows the numbers of PAGASA staff and personnel responsible for the operation and maintenance of this project. The hydrologists and hydro aides shown in the table refer to staff members who are responsible for flood forecasting and warning. Similarly, telecom engineers and technicians refer to staff members who maintain rainfall and water-level gauging stations as well as telecommunication steel towers. Telecommunication personnel who belong to HMD go around and visit each sub center to collaborate with the sub-center telecommunication personnel for the maintenance work. According to the management of HMD, Pampanga and Agno Sub

[28] There are Bicol and Cagayan Sub Centers in addition to Pampanga and Agno Sub Centers.

Centers who were interviewed, they “have just enough people to carry out the required tasks.”

Table 3: Staffing Levels at HMD and Each Sub Center

Name	Hydrologists and Hydro Aides	Telecom engineers and technicians
HMD	20 persons	13 persons
Pampanga Sub Center	4 persons	1 person
Agno Sub Center	5 persons	2 persons

Source: Answers to the questionnaire

With regard to the system of maintenance for the FFWS facilities and equipment procured and installed by this project, HMD’s telecom engineers and technicians are conducting maintenance and inspection every three months. In case telecommunication equipment requires major repairs and if the situation is beyond the capacity of PAGASA, they contact the local office of the supplier (Japanese-affiliated company) to address the matter.

Based on above, it can be judged that HMD and sub centers have sufficient numbers of staff. It is also observed that a system in place to maintain the facilities and equipment. Therefore, no major problems are observed in the institutional aspects of the operation and maintenance system.

3.5.2 Technical Aspects of Operation and Maintenance

Since the completion of this project, PAGASA has been conducting training periodically for hydrologists and hydro aides, telecom engineers and technicians and Pampanga and Agno Sub Center staff[29]. Additionally, it has been confirmed through the interviews that that PAGASA’s staff members were fully aware of the importance of operation and maintenance as well as the functions and specifications of the facilities and equipment procured by this project. Furthermore, it has also been confirmed through the interviews that the telecom engineers and technicians responsible for the operation and maintenance of the facilities and equipment had extensive professional experience and were skilled to address the failure or problem of telemetry observation systems.

For newly recruited staff, training is also provided. On the other hand, the need was observed to increase the number of young staff in order to revive the organization in the future. Although

[29] For example, they conducted practical training, including “Training on Operation and Maintenance of the Flood Forecasting and Warning Facilities and Equipment in Agno and Pampanga River Basins” (2011), “Quantitative Rainfall Forecasting Training” (2012), “Seminar on Data Collection for Country-Wide Flood Forecasting and Warning” (2013).

training is provided to young staff, there seems to be a need to increase the number of staff and the number of training, thereby revitalizing the organization.

In addition to the above-mentioned internal training for its staff, PAGASA is also organizing the Hydrologist Training Course (HTC) on the subject of hydraulic and hydrological technologies. It is because PAGASA hopes to secure human resources from the training participants when they commence new projects in the future, particularly the expansion of the flood forecasting and warning services in other major river basins in the Philippines. A total of 32 individuals have attended this training series since it began in August 2013. PAGASA is able to conduct training in such a way that it responds to the demands of the public because they have been developing human resources backed by long years of Japan's technical assistance. It is also because PAGASA has been steadily organizing internal training since the late 1990s and has been making efforts to send its staff to different training courses in and outside the Philippines.

Based on the above, PAGASA has been holding training frequently and its staff members have ample professional experience. It can thus be considered that the technical standard of PAGASA is sufficient to handle the periodic operation and maintenance. Therefore, no major problems are observed in the technical aspects of the operation and maintenance system.

3.5.3 Financial Aspects of Operation and Maintenance

Table 4 shows the changes in the personnel and maintenance cost for PAGASA as a whole. The cost is increasing after the project completion as compared to that of the three years before the project commencement. It is because PAGASA's workload has been increasing across the organization in relation to meteorological observation, telecommunication, analysis, forecasting and warning as well as related research and advocacy work. Accordingly, the needed budget has been allocated by the central government.

Table 4: Personnel and Maintenance Cost for PASASA as a Whole

(Unit: thousand pesos)

Item	Before Project Commencement			After Project Completion		
	2003	2004	2005	2011	2012	2013
Personnel and Maintenance Cost	314,825	305,264	303,986	564,034	493,423	618,029

Source: PAGASA

In addition, Table 5 provides data indicating the yearly budget of HMD, a division

responsible for the operation and maintenance of this project. According to the interviews with PAGASA, the budget is sufficient to operate and maintain the systems and rainfall and water-level gauging stations developed by this project. It should be noted that HMD's budget for the three years after the completion is less than that of the three years before the project commencement because of the difference in personnel cost. According to PAGASA, the personnel cost of the three years before the project commencement includes the personnel cost of each sub center, while the personnel cost at the time of the ex-post evaluation does not include that of sub centers—it only reflects the personnel cost of HMD staff. Although it was attempted during this evaluation study, the personnel cost of sub centers could not be obtained. Nevertheless, sufficient personnel cost is expended according to PAGASA[30]. It can be observed that the other expense items are generally increasing after the project completion. This reflects the fact that PAGASA's responsibilities are expanding as discussed above. According to the interviews with the management of HMD, Pampanga and Agno Sub Centers about the operation and maintenance cost consumed for this project, they confirmed that it was sufficient for the operation and maintenance of the facilities and equipment of the telemetry observation systems, the rainfall and water-level gauging stations and the two sub centers. Considering the above, no major problems are observed in the financial aspects of the operation and maintenance system.

Table 5: Changes in Budget of HMD, PAGASA

(Unit: thousand pesos)

Item	Before Project Completion			After Project Completion		
	2003	2004	2005	2011	2012	2013
Salary expenses	22,807	22,556	19,335	2,248	3,302	3,609
Travel expenses	1,052	1,427	1,370	2,014	2,185	1,981
Telecommunication fees	586	181	196	1,074	577	2,047
Maintenance fees for building and facilities	1,583	413	893	3,383	2,151	2,073
Maintenance fees for vehicles	701	1,232	1,215	2,858	2,114	643
Transportation fees	327	262	252	612	612	612
Equipment expenses	2,594	4,301	3,482	8,741	3,344	4,033
Rent fees	353	928	906	812	812	336
Water, electricity, etc, expenses	3,879	3,783	4,403	6,692	6,589	7,089
Training fees	440	225	215	325	761	414

[30] According to the interviews with the management and other staff of Pampanga and Agno Sub Centers, no concerns were observed in particular concerning the salary levels.

Petrol, oil fees	200	251	340	383	487	634
Insurance	-	-	-	150	150	164
Others	3,259	3,487	4,037	4,059	4,185	8,034
Total	37,781	39,046	36,644	33,351	27,269	31,669

Source: PAGASA

3.5.4 Current Status of Operation and Maintenance

During the field study conducted as part of this evaluation survey, no major problems were observed in the operation and maintenance of the telemetry observation systems procured and installed inside HMD, Pampanga and Agno Sub Centers, the rainfall and water-level gauging stations and the telecommunication steel towers (with the exception of Mayapyap rainfall gauging station, which will be discussed below). Periodic cleaning and checking of the function of the equipment are carried out in accordance with the checklist provided in the maintenance manual. It has been confirmed through the site inspections and interviews with telecom engineers and technicians responsible for the operation and maintenance that equipment was functioning well without any problem. On the other hand, with regard to Mayapyap rainfall gauging station in Pampanga River Basin, the antenna tower within the gauging station was damaged as a result of the typhoon in October 2013.. While PAGASA is drafting a recovery plan at the time of the ex-post evaluation, it is deemed necessary to address the matter as soon as possible[31].

Spare parts are stored in the headquarters of PAGASA (Quezon City). According to the interview with PAGASA, they have not experience any shortage or delayed distribution concerning the procurement of spare parts.

With regard to the theft of sensor signal cables[32] at different rainfall gauging stations, which was described in “3.2.1 Quantitative Effects” under Effectiveness, the Philippine government issued the Republic Act No. 10344 in 2012 (act penalizing unauthorized stealing of equipment and accessories) and is trying to strengthen its control measures. While there is no incidence of theft since 2012, it is expected that PAGASA should continue its efforts for theft prevention.

No major problems have been observed in the institutional, technical and financial aspects of the operation and maintenance system. Therefore sustainability of the project effect is high.

[31] PAGASA does not own the heavy machinery necessary for the recovery work; thus they are requesting DPWH to provide the necessary machinery at the time of the field study (January 2014). According to PAGASA, the recovery work is expected to be completed early this year (and no later than before the rainy season begins in June).

[32] It has not occurred since 2012.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

With an aim to improve the function of FFWS, this project enhanced FFWS related facilities and procured and installed materials and equipment in Pampanga and Agno River Basins located in the Central Luzon Region. At the time of the ex-post evaluation, this project is in line with the policy such as “the Mid-Term Philippine Development Plan” and the development needs to further improve FFWS; thus relevance is high. Through this project, the missing rate of data collection in the telemetry system and the observation time for FFWS improved mostly as planned. In addition, interviews with the local government agencies and towns/villages (barangays) confirmed that FFWS developed by the project was transmitting accurate rainfall and water-level information to the relevant agencies and securing sufficient time for evacuation (lead time) at times of floods. Thus effectiveness and impact is high. Although the project cost was within the plan, the project period exceeded the plan; thus efficiency is fair. On the other hand, problems were not observed in the institutional, technical and financial aspects of PAGASA, the implementing agency; thus sustainability is high.

In light of the above, this project is evaluated to be highly satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

1) At Mayapyap rainfall gauging station, the antenna tower was damaged due to the typhoon in October 2013. It is recommended that PAGASA should carry out the recovery work as soon as possible and make efforts toward improving the situation concerning missing rainfall data.

2) With regard to the institutional aspects (particularly the number of staff) of the operation and maintenance, while telecom engineers and technicians at PAGASA’s headquarters have long years of experience and are fully skilled to carry out the required maintenance works, most of the main staff are in their 40s. With a view to ensuring that the facilities and equipment procured and installed by this project continue to be maintained in the future, it is recommended that PAGASA should increase the number of young staff and revitalize the organization thereby establishing the organizational structure in such as way that proper maintenance is ensured.

4.3 Lessons Learned

1) Necessity of Collecting Accurate Information on Project Sites and Scope before the Project

Commencement

In this project a change was made to the project scope in connection to the station building and steel tower construction because it was found at the time of the detailed design that an airport existed near the project site. It is thus critical that both the Japanese and Philippine sides meticulously gather as much information as possible before the project begins thereby striving to determine the project scope in such a way that the project will not be delayed.

2) Accumulation of Training and Human Resource Development for Enhanced Sustainability

PAGASA is conducting training courses in accordance with the needs of its staff. This has been made possible through the long years of Japanese technical assistance which supported human resource development and steadily improved the technical standards of PAGASA. PAGASA began to demonstrate ownership and capacity to organize internal training on its own in the late 1990s. PAGASA also continuously took part in training courses held in and outside the Philippines. Presumably, such efforts also contributed to improving PAGASA's technical standards[33]. Based on such development, it can be said that it is possible to improve the technical skills of the implementing agency and enhance the sustainability of the project if the agency appropriately responds to the training needs[34] and captures training not as a one-time event but as a program that should be worked on continuously.

[33] In addition, it is also because PAGASA understood the increasing needs of the citizens for flood forecasting and warning due to the occurrence of natural disasters.

[34] JICA also contributed to capacitating PAGASA staff by implementing the "Project for Strengthening of FFWS for Dam Operation" in 2009-2012 (technical cooperation project).

Republic of the Philippines

Ex-Post Evaluation of Japanese Technical Cooperation Project

"Strengthening the Flood Management Function of DPWH"

External Evaluator: Miyuki Koga, Octavia Japan Co., Ltd.

0. Summary

This project aimed to strengthen the flood management function of the Department of Public Works and Highways (hereinafter referred to as "DPWH") through research and development, training, development of information management system, implementation of pilot projects, and establishment of internal support system. The project is in line with the "Mid-Term Philippine Development Plan (2004-2010)", which places importance on expanding investment in flood control infrastructures. The project also responds to the needs of the Philippines to strengthen flood management functions because the country is affected by many natural disasters. Thus the project is consistent with the Philippine development policy and needs. In addition, the project is consistent with Japan's ODA policy as it is in line with the "Country Assistance Plan for the Philippines". Therefore, relevance is high. Through this project, engineers at the Flood Control and Sabo Engineering Center (hereinafter referred to as "FCSEC") became able to lead flood control for small rivers, and the targets for the project outputs and the project purpose were largely achieved. In addition, the project is contributing to the design and construction of appropriate flood control and sabo structures; thus effectiveness and impact are also high. Although the project period was within the plan, the project cost slightly exceeded the plan; thus efficiency is fair. The project remains consistent with the development policy and needs of the Philippines after the project completion. Most of the experienced engineers who accumulated knowledge and skills through this project are still working at DPWH, and flood control budget has been on the increase within DPWH; thus no problems are observed in the technical and financial aspects of the implementing agency. However, shortage of staff is evident in the implementing agency despite the fact that their responsibilities have been increasing; thus some problems are observed in terms of the institutional aspects of the implementing agency. Therefore, sustainability is fair.

In light of the above, this project is evaluated to be satisfactory.

1. Project Description

Project Location[1]

Pilot Project Site (Kinanliman River)

1.1. Background

In the Philippines natural disasters such as floods, debris flows and others occur frequently. On the other hand, there was no dedicated office within DPWH although DPWH was mandated to develop flood control and sabo infrastructure. As a result, the development of flood control and sabo infrastructure was insufficient in terms of quality and quantity. In response to such a situation, the government of the Philippines established FCSEC under DPWH in 1999 and requested Japanese assistance for strengthening the flood management function. Recognizing the urgency of improving flood control and sabo technologies in the Philippines, JICA implemented the "Project for Enhancement of Capabilities in Flood Control and Sabo Engineering of DPWH" (January 2000 - June 2005). Through the said project (hereinafter referred to as "the previous project"), FCSEC engineers became able to plan and implement training in design, construction and maintenance. However, it was pointed out that technologies did not reach a certain level in terms of practical application as well as river and sabo engineering research, which required improvement. In addition, the need was confirmed to improve the capability of executing the entire cycle of flood control projects—planning, designing, construction and maintenance. Based on such situations, it was decided that this project should be implemented as a subsequent project.

1.2. Project Outline

Overall Goal	More effective and appropriately designed flood control and sabo structures/facilities plans are implemented by DPWH in accordance with the technical standards, guidelines and manuals.

[1] This project targets the entire Philippines while pilot projects were implemented as part of this project at three sites indicated in the Project Location picture above.

Project Purpose		The flood management function of DPWH is strengthened through research and development, training, information management, implementation of pilot projects and creation of the internal support mechanism.
Outputs	Output 1	Pilot projects are implemented using the technical standards, guidelines and manuals.
	Output 2	Research is conducted for developing/updating technical standards, guidelines and manuals, and assessing efficient countermeasures for flood control and sabo.
	Output 3	Improve knowledge and skills of DPWH engineers on flood control and sabo through training programs.
	Output 4	Information Management System is established for a more effective flood management function of DPWH.
	Output 5	The internal support mechanism is created to sustain the development of technology and organization in the field of flood control and sabo engineering.
Inputs		Japanese Side: 1. Experts (19 persons in total) 6 persons for Long-Term (3 fields, 2 persons each) 13 persons for Short-Term 2. Eight Trainees Received (counterpart training in Japan) 3. None for Third-Country Training Programs 4. Equipment Approximately 5.3 million peso 5. Local Cost Approximately 7.7 million peso Philippine Side: 1. 27 counterparts 2. Land and facilities, Project Office 3. Local Cost Approximately 53 million peso 4. Pilot Project 45 million peso[2]
Total Cost		390 million yen
Period of Cooperation		July 2005 – June 2010
Implementing		The Flood Control and Sabo Engineering Center (FCSEC)

[2] The pilot project cost borne by the Philippine side is reported to be 53 million peso according to a document provided by JICA. On the other hand, according to FCSEC, the fund provided through this project is 45 million peso, while additional 25 million peso was secured by the District Engineering Office for the Kinanliman River pilot site (70 million peso in total).

Agency	The Department of Public Works and Highways (DPWH)
Cooperation Agency in Japan	River Bureau, the Ministry of Land, Infrastructure and Transport (at that time)
Related Projects	"Project for Enhancement of Capabilities in Flood Control and Sabo Engineering of DPWH" (Technical Cooperation Project, January 2000 - June 2005) "The Project for Construction of Hydraulic Laboratory Building" (Grant Aid, EN signed on June 27, 2001, Detailed Design: 46 million yen, Construction: 799 million yen)

1.3. Outline of the Terminal Evaluation

It was judged that each output and the project purpose were largely achieved. In particular, it was positively received that the engineers, who had developed the basic knowledge of flood control through the previous project, acquired concrete technical skills and became able to provide technical guidance to field office[3] staff by actually engaging in the entire cycle of planning, design, construction and maintenance. However, an issue remained in terms of sustainability; and it was deemed essential that FCSEC should become a permanent office within DPWH in order for the overall goal to be achieved.

1.3.1. Achievement of Project Purpose at the time of the Terminal Evaluation

FCSEC was the only office within DPWH which had the function of accumulating flood control technologies, and its technical level reached the extent that it could influence DPWH's policy decisions on flood control. Therefore, it was judged that the project purpose was achieved except for the sustainability aspect.

1.3.2. Achievement of Overall Goal at the time of the Terminal Evaluation

It was confirmed that 4 field offices had constructed flood control structures in accordance with FCSEC's technical standards and manuals by the time of the terminal evaluation, which was considered insufficient. Similarly, FCSEC developed the National Flood Management Framework Plan (NFMFP) and presented it at the cabinet meeting of the National Disaster Coordinating Council (NDCC) in February 2006; however, the plan was not approved officially. On the other hand, this project was thought to have various spillover effects, and no negative effect was observed; thus other impacts were judged to be significant. Although it was not certain at the time of the terminal evaluation whether

[3] In this report, DPWH's "regional offices" and "district engineering offices" are referred to as "field offices" when combined.

or not the overall goal would be achieved, there was an expectation that the number of flood control structures constructed in accordance with FCSEC's technical standards, guidance and manuals would increase as FCSEC gradually gained popularity. However, for the overall goal to be achieved, it was considered necessary that FCSEC should become a permanent office.

1.3.3. Recommendations at the time of the Terminal Evaluation

Based on the above, the following recommendations were made to those involved in the project.

① DPWH and other concerned agencies should make FCSEC a permanent office.

② DPWH and FCSEC should allocate appropriate number of technical posts and secure operational budget for FCSEC. It is also suggested that a system should be established to allow skilled, mid-level and young engineers to work together so that technologies are surely transferred to the next generation.

③ With regard to the development of the Master Plans (hereinafter referred to as "M/P") and the Feasibility Studies (hereinafter referred to as "F/S") for 12 river basins, DPWH should secure sufficient budget to carry out experiments on flood control structure at the Hydraulic Laboratory.

④ FCSEC and DPWH should adopt a human resource policy which allows engineers to engage in river related projects from planning to maintenance. Also, it is recommended that engineers take part in studies by visiting sites, making technical drawings, and gaining opportunities to lead the construction and maintenance, instead of leaving the entire work to consultants.

⑤ The 12 river basins, for which the M/P and F/S preparation began, are larger in scale than the ones targeted for the pilot projects. Therefore, JICA is recommended to make the necessary preparation, such as dispatching Japanese experts who can provide technical advice to FCSEC engineers.

2. Outline of the Evaluation Study

2.1. External Evaluator

Miyuki Koga, Octavia Japan Co., Ltd.

2.2. Duration of Evaluation Study

Duration of the Study: November 2013 – September 2014

Duration of the Field Study: January 19 – February 1, 2014, April 20 – 26, 2014

2.3. Constraints during the Evaluation Study

A total of 191 field offices were requested to answer the questionnaire for the beneficiary survey conducted as part of this evaluation study; however, the number of respondents was 43. Therefore, it is necessary to take into account that the beneficiary survey results may not necessarily represent the average situation of the country.

3. Results of the Evaluation (Overall Rating: B[4])

3.1. Relevance (Rating: ③[5])

3.1.1. Relevance to the Development Plan of the Philippines

At the time of the project implementation, the "Mid-Term Philippine Development Plan (2004-2010)" and the "Medium-Term Public Investment Program (2005-2010)" were formulated in the Philippines. The former emphasized the importance of mainstreaming disaster response strategy and improving flood control infrastructures in "Chapter 3: Environment and Natural Resource," while the latter identified investment in flood control as one of the 10 main strategies. In addition, the "Strategic Plan of DPWH (2004-2010)" mentioned FCSEC's flood control works as one of the major strategies. Therefore, this project, which aims to strengthen the flood control management function, is consistent with the development policy of the Philippine government throughout the project period, from the project commencement up to the project completion.

3.1.2. Relevance to the Development Needs of the Philippines

In the Philippines natural disasters like flooding, slope failures and sediment runoff occur frequently. In 10 years from 2001 to 2010, more than 10,000 people were killed and over 4,000 people went missing because of typhoons, and the total damage amounted to approximately 247.4 billion peso[6] in the same period. In order to minimize such damages, it was highly important to plan, construct and maintain appropriate flood control structures. For that, it was essential to improve and strengthen the flood management function. Therefore, it can be said that this project, which aims to strengthen the flood management function, is consistent with the development needs of the Philippines.

3.1.3. Relevance to Japan's ODA Policy

The Country Assistance Program for the Philippines, which was developed by the Ministry of Foreign Affairs of Japan in 2000, identified 4 priority areas, one of which was "environmental protection and anti-disaster measures." In this plan the need was emphasized to "continue to provide aid for flood and sand control and earthquake-related

[4] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory
[5] ③: High, ②: Fair, ①: Low
[6] The figures are taken from the statistics provided by the National Disaster Risk Reduction and Management Council (NDRRMC) administered by the Office of Civil Defense (OCD).

measures, while also assisting in developing the necessary systems and capacity in related government institutions from a medium- to long-term perspective." This project aimed to strengthen the disaster prevention function of the Philippines and is in line with the above priority and sector assistance policy (environmental protection and anti-disaster measures). Therefore, it is consistent with the assistance policy of Japan.

This project has been highly relevant to the country's development plan, development needs, as well as Japan's ODA policy. Therefore, its relevance is high.

3.2. Effectiveness and Impact[7] (Rating: ③)

3.2.1. Effectiveness

3.2.1.1. Project Output

1) Output 1: "Pilot projects are implemented using the technical standards, guidelines and manuals"

Three pilot projects were implemented as part of this project. The objectives of the pilot projects were to confirm the applicability of the technical guidelines and manuals developed by the previous project through the actual use and to strengthen the technical skills of FCSEC and field office staffs by having them experience the entire cycle of flood control projects, such as planning, design, construction and maintenance. Out of these, output 1 was not fully achieved by the time of the project completion as it will be discussed below.

Indicator 1: At least 3 pilot projects (revetment, spur dike and sabo dam) are planned, designed, constructed and maintained

The pilot projects were implemented in three different places: Kinanliman River (revetment), Digmala River (revetment and spur dike) and Santa Fe River (sabo dam). For Kinanliman River, dike construction was planned to prevent river flooding. New technologies were introduced such as *netsugi* ("grafting") method[8], and by July 2009 about 270m of dike revetment was completed, which was maintained without problems at the time of the project completion. Digmala was an alluvial-fan river and had a characteristic of changing river courses. As bank erosion was anticipated, construction of revetment and spur dikes was planned to prevent houses and farm lands from flooding. It was completed before the project completion and was maintained without problems at the time of the project completion. As for Santa Fe River, construction of sabo dam was planned to prevent riverbed aggradation caused by runoff sediment and to prevent

[7] Sub-rating for Effectiveness is to be put with consideration of Impact.

[8] It is a method used to utilize the old revetment for a new revetment by building on the foundation. It has a benefit of reducing construction cost and waste.

associated flooding and sediment disasters. For the first time in the Philippines, low-cost "soil cement", a mixture of sediment and cement, was introduced to construct the dam body. At the time of the project completion in June 2010, the construction was behind schedule at about 80% completion rate. The delay was mainly caused by the fact that the Department of Budget and Management (DBM) typically issued budget execution orders late. Upon the issuance of the budget execution order in October 2009, sabo dam construction was carried out rigorously by concentrating project staff and construction workers. However, it was not possible to complete the construction within the project period.

It has been confirmed through the site inspections during the ex-post evaluation that the sabo dam itself is completed and that there is no major structural damage or problem with its function of preventing riverbed aggradations caused by runoff sediment. However, the "raising of the road embankment[9]", which was initially planned for the purpose of structurally strengthening the sabo dam, could not be confirmed[10]. At the time of the ex-post evaluation, the left wing of the sabo dam is sticking out. If it is left as it is, problems are anticipated in terms of traffic and dam protection[11]; thus it is thought necessary to raise the road embankment as per the initial plan.

2) Output 2: "Research is conducted for developing/updating technical standards, guidelines and manuals; and assessing efficient countermeasures for flood control and sabo"

As it will be discussed below, output 2 was completed without problems by the time of the project completion.

Indicator 1: Recommendation is made for the revision/ modifications/ updating of the technical standards, guidelines and manuals

A technical working group was formed in October 2008 with the aim of revising the

[9] According to former Japanese experts, a normal approach would be to have the sabo dam's wing tucked in the mountain thereby integrating the dam and the mountain; however, because there was a road on the left side of the dam with 7 meter distance to the mountain, it was planned to tuck the wing in the embarked road so as to stabilize the structure, aiming to reduce cost.

[10] The road construction was implemented by a District Engineering Office as a separate road improvement project. Based on what was gathered from the interviews with those involved in the project, the following can be said: (1) FCSEC's monitoring and follow up after the project completion was not sufficient; and (2) the plan to strengthen the structure by tucking the sabo dam wing in the embarked road was not well understood or communicated among the District Engineering Office.

[11] According to former Japanese experts, "If it is left as it is, scour could occur just downstream of the wing and behind the left-side wall had water run behind the left wing (on the road). In addition, the wing would have to stand along inside the flooding stream, so it would be vulnerable to the force of sediment and stream. Moreover, there is a concern that external forces might have an unintended effect because the ways the right side and the left side of the sabo dam are connected to the mountain are different. Therefore, it is necessary to raise the road embankment as it was initially planned so as to integrate the sabo dam wing with the mountain, making it structurally-sound."

technical standards, guidelines and manuals, and recommendations and revisions were made as planned.

Indicator 2: Appropriate countermeasures based on actual field requirements are recommended

Technical assistance such as flood control assessment was provided based on the requests from District Engineering Offices (hereinafter referred to as "DEO") and Local Government Units (hereinafter referred to as "LGU"). In addition, it was confirmed through interviews with DEO staff and the beneficiary survey[12] that FCSEC's advice responded to the field requirements and the needs of DEOs[13].

Indicator 3: Alternative low cost flood control and sabo structures are developed

Through this project, construction of sabo dam using soil cement was demonstrated for the first time in the Philippines, and related technologies were transferred to FCSEC and DEOs. Based on these results, the "Manual on Soil Cement" was developed. It was confirmed through the interviews with DEO staff that the benefits of soil cement were acknowledged to some extent. On the other hand, a comment was made, "Although we are keen to use soil cement, it is not easy to request the budget because soil cement is not listed in the DPWH Standard Specifications[14] as a cost item." According to the Bureau of Research and Standards, which oversees issues related to standards and specifications, certain procedures[15] are needed to approve new materials or products in the presence of the Bureau staff. Although the Bureau was one of the Joint Coordination Committee (hereinafter referred to as "JCC") members of this project, no bureau staff accompanied to the pilot project site where soil cement was introduced. Thus a negotiation will be necessary to add soil cement to the DPWH Standard Specifications as an approved cost item. While it is clear that this issue needs to be followed up, it was groundbreaking that low-cost soil cement was used for the dam body for the first time in the Philippines. Therefore, it can be judged that this indicator was largely achieved.

Indicator 4: Reports on the usage/ applicability of the technical standards, guidelines and manuals are prepared

Four different technical reports were prepared on the usage/ applicability of the

[12] A beneficiary survey was conducted targeting DPWH Regional Offices and DEOs based on self-administered questionnaires. (Requests were sent to 191 offices targeted by this project, and answers were received from 43 individuals.)

[13] 76% of the 38 individuals who answered this question selected "Yes, FCSEC's technical assistance responds to the needs of field offices." (The remaining 24% answered "I do not know.")

[14] This guideline is commonly called "blue book"; and it specifies construction materials and products that are commonly used by DPWH.

[15] More specifically, it is mandatory to follow the following steps: (1) experiment and evaluation; (2) implementation of a pilot project on a small scale; (3) observation for one year and evaluation; (4) implementation on a full scale; and (5) observation for five years and evaluation. It is based on the Department Order 189 issued on August 8, 2002.

technical standards, guidelines and manuals[16].

3) Output 3: "Improve knowledge and skills of DPWH engineers on flood control and sabo through training programs"

With the view to obtain knowledge of flood control and sabo, a total of 558 DEO technical staff participated in the training program which had a total of 22 sessions on 4 different topics. As it will be described below, targets were achieved for all the indicators.

Indicator 1: Increased level of proficiency of engineers of more than 100 offices through the training on planning and design of flood control structures

Technical staff of 111 field offices attended the training.

Indicator 2: Increased level of proficiency of engineers of 40 offices through the training on planning and design of sabo works engineering

Technical staff of 45 field offices attended the training.

Indicator 3: Increased level of proficiency of engineers of more than 100 offices through the training on construction supervision of flood control and sabo projects

Technical staff of 107 field offices attended the training.

Indicator 4: Increased level of proficiency of engineers of more than 100 offices through the training on maintenance of flood control and sabo structures

Technical staff of 109 field offices attended the training.

The beneficiary survey[17] was conducted targeting the training participants (field office staff) using self-administered questionnaires. The results are summarized in Figure 1-4, from which it can be observed that there were no problems with the contents and quality of the training and that the outcome of the training is being utilized at the time of the ex-post evaluation.

[16] Through this project, a total of 6 documents (3 manuals and 3 technical standards and guidelines) were developed or revised. While there has been an instruction to refer to these technical documents when implementing flood control projects, soil cement is not recognized as a standard cost item in the DPWH Standard Specifications. Therefore, there seems to be some coordination issue within the department.

[17] As it was discussed above, 191 DPWH field offices were requested to answer the questionnaire, and 43 staff members sent in their answers.

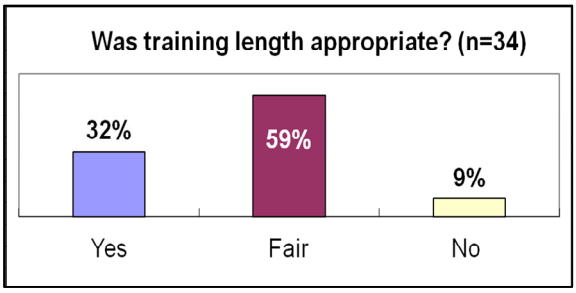


Figure 1: Length of the Training

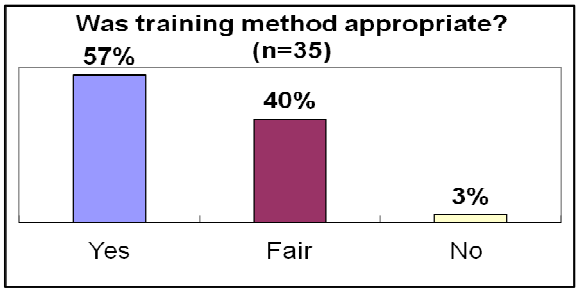


Figure 2: Training Method[18]

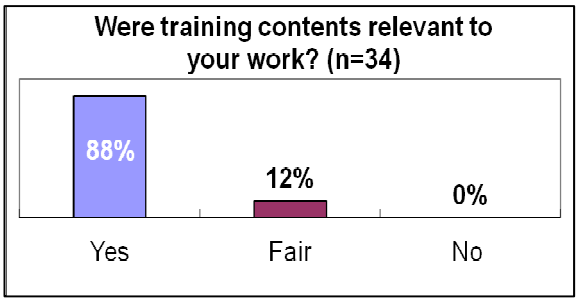


Figure 3: Training Contents

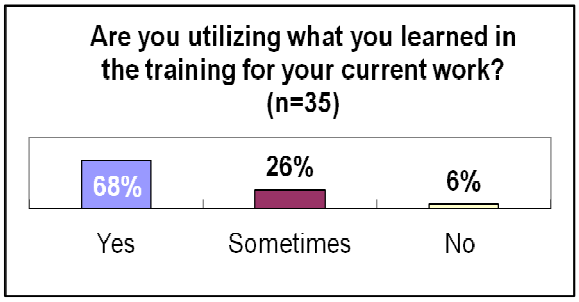


Figure 4: Utilization of the Training

As a result of the interviews with field office staffs and the beneficiary survey, a number of comments requesting the continuation of the flood control training were made, such as this: "There are some colleagues who could not attend the training, and we also have many young staff newly recruited. We would like the flood control training to continue in the future." While FCSEC has not organized any flood control training since the project completion, flood control is included in DPWH's regular training[19] organized by the headquarters. In such occasions FCSEC staff members serve as resource persons. In addition, some regional offices have taken the initiative in organizing flood control training courses[20]. Therefore, it can be observed that there is a great demand for the continuation of the flood control training.

4) Output 4: "Information management system is established for a more effective flood management function of DPWH"

As it will be discussed below, each indicator was largely achieved, and this output was achieved without problems.

[18] "Training method" refers to a group size and balance between lectures and practices.
[19] This includes the Candidate District Engineer Course conducted semi-annually and the Comprehensive Field Engineers Training conducted annually.
[20] For example, Regional Office III organized training on flood control planning and design by inviting 3 engineers from FCSEC. Similarly, Regional Office II planned and implemented the training for DEOs by utilizing training materials developed by this project.

Indicator 1: Networks with other related agencies/organizations are established for improved data sharing and coordination

FCSEC established networks with DPWH field offices by providing jurisdiction maps and collecting/updating information on flood control structures. In addition, through various technical working groups, information was shared with relevant organizations outside DPWH, such as the Philippine Atmospheric, Geophysical and Astronomical Services Administration (hereinafter referred to as "PAGASA"), the National Water Resources Board (hereinafter referred to as "NWRB"), the Philippine Institute of Volcanology and Seismology (hereinafter referred to as "PHIVOLCS"), the Department of Environment and Natural Resources (hereinafter referred to as "DENR") – River Basin Control Office (hereinafter referred to as "RBCO"), the Metropolitan Waterworks and Sewerage System (MWSS) and the Office of Civil Defense (hereinafter referred to as "OCD").

Indicator 2: Coordination meetings /seminars on flood and sabo management are held with other related agencies /organizations at least once a year

With the aim of sharing information on the piloting of flood control and sabo technologies, a number of seminars were held and attended by different offices/divisions of DPWH, the National Economic Development Authority (hereinafter referred to as "NEDA"), PAGASA, NWRB, PHIVOLCS, LGUs, universities and NGOs.

Indicator 3: Adequate data and information are collected, analyzed and compiled in the database

At the end of 2006 FCSEC collected information concerning the locations and types of flood control structures that existed in the country[21]. The data was updated in 2009[22]. At the time of the ex-post evaluation, the established database is utilized by the Bureau of Maintenance to examine the maintenance budget requests from field offices. According to the Bureau of Maintenance staff, they have been partially updating the database handed over by FCSEC based on the lists of flood control structures submitted by field offices when they request maintenance budget. However, as a result of the rationalization[23] which was implemented across DPWH, the number of the bureau staff dramatically reduced from 153 to 83, and update of the database has not been sufficient[24].

According to FCSEC, DPWH is envisaging the upgrading of the flood control database at the time of the ex-post evaluation. The current database contains a list of locations and types of flood control structures existing in the country. In the future, however, more

[21] Information was gathered from 138 DEOs.
[22] Data was collected from 112 DEOs.
[23] Rationalization was carried out across the nation among government institutions based on the President's Executive Order No. 366. The idea is to streamline the organizations with the aim of making the government more efficient. DPWH was also obliged to reduce its staff significantly.
[24] For example, database was only updated for Luzon and not for the entire country in 2013.

useful database is expected by incorporating GPS mapping of rivers and flood control structures and by using information gathered for the M/P and F/S that have been developed thus far. FCSEC is expected to provide technical inputs concerning the database contents and the ways of establishment and management[25].

Although the database is expected to be upgraded in the future, the contribution of this project is significant in a sense that information on flood control structures, which had not been existed in the country, was collected and compiled as database. Therefore, it can be judged that this indicator was achieved.

Indicator 4: Annual Report is submitted at the end of the year. FCSEC Newsletter is published twice a year.

While FCSEC Newsletters were issued 4 times during the project period, it was not as frequent as the initial plan (twice a year), except for the year of 2007[26]. On the other hand, reports for NEDA were submitted every quarter, which was more frequent than planned. Therefore, it can be judged that this indicator is largely achieved.

5) Output 5: "The internal support mechanism is created to sustain the development of technology and organization in the field of flood control and sabo engineering"

At the time of the commencement of this project, FCSEC was a project management office with a temporal status within DPWH. This meant that FCSEC staff members except for the management were all contract employees. It was thus considered crucial to establish a system so that those who developed technical skills through the previous project and this project would stay and contribute to the flood management of DPWH even after the project. It was thought that flood control and sabo technologies could be accumulated within DPWH if FCSEC became a permanent office of DPWH; and this output aimed to establish an internal support mechanism which would facilitate such a process. However, as it will be discussed below, this indicator was not achieved within the project period. On the other hand, the development on the issue of FCSEC's permanency after the project completion will be discussed later in "3.4 Sustainability."

Indicator 1: Recommendations in support of the project objectives / goals are approved by the JCC

JCC and Technical Working Group (hereinafter referred to as "TWG") were formed in order to promote this project. The objective of JCC was to monitor the whole project, and it was chaired by Assistant Secretary of Planning Service and attended by DPWH's main offices/bureaus (Planning Service, the Bureau of Design, the Bureau of Research and

[25] FCSEC thinks that the upgrading of database is an important mission and is seeking technical assistance from countries like Japan.
[26] Newsletter was issued in March 2007, December 2007, December 2008 and January 2010.

Standards and the Bureau of Maintenance). On the other hand, TWG was formed mainly to share information on pilot projects, and its members were DPWH's main offices/bureaus. Although a number of attempts were made by those engaged in the project through JCC, no decision was made to support the idea of making FCSEC a permanent office before the project completion. This is mainly because the implementation of the rationalization which began in 2004 was extended for a long period of time. It was extremely difficult to separate the discussion of FCSEC's permanency from the department-wide rationalization process.

Indicator 2: ①Plan/document on the sustainability of the project gains is submitted to and approved by DPWH management

Although a number of attempts were made by FCSEC and those involved in the project through JCC and others, permanency of FCSEC was not approved before the project completion. As discussed above, it was due to the prolonged rationalization process which was carried out in the whole department.

3.2.1.2. Achievement of Project Purpose

Project Purpose: "The flood management function of DPWH is strengthened through research and development, training, information management, implementation of pilot projects and creation of the internal support mechanism"

This project aimed to strengthen flood management capacity of FCSEC and field office staffs. It was confirmed through this evaluation survey that FCSEC engineers enhanced their capacity by the time of the project completion to the extent that they would be able to manage flood control for small rivers and to handle standard hydraulic experiments. Conventionally, flood control structures used to be constructed without thoroughly considering the predicted river flows during heavy rain and the characteristics of rivers in the Philippines. FCSEC staff developed capabilities to the extent that they could lead appropriately planned flood control measures by engaging in the planning, design and construction management of the three small-scale rivers selected for the pilot projects. As for hydraulic experiments, FCSEC could not independently implement the experiments without Japanese experts' guidance before the project commencement. Through this project, a number of experiments were conducted: hydraulic experiments to evaluate the effects and impacts of flood control structures (7 times); experiments to evaluate the suitability of low-cost flood control structures (4 times); and experiments to evaluate

other flood control related aspects (6 times)[27]. Through these experiments, FCSEC developed technical skills to independently plan, design, construct, implement, collect and analyze data for hydraulic experiments[28]. The fact that engineers were nurtured in such a way that they became able to plan, implement and supervise flood control projects in accordance with the characteristics of the rivers through this project can be considered as one factor that contributed greatly to the achievement of the project purpose. The extent to which each indicator was achieved will be discussed below.

1) Indicator 1: Policies and Regulations of DPWH which reflect recommendations provided by FCSEC

No policy or regulation reflecting FCSEC's recommendation was developed during the project period (July 2005-June 2010). The Department Order No. 28 was issued on January 31, 2005, which made it mandatory "for DPWH technical staff engaged in flood control management to use the technical guidelines and manuals developed by FCSEC." However, this order was issued before the commencement of this project. Similarly, Planning Service issued a memorandum on November 8, 2010 to all regional offices, notifying them about the manuals that revised and developed by this project. This memorandum was issued after the project completion. Therefore, this indicator was not sufficiently achieved.

2) Indicator 2: Utilization of technical standards guidelines and manuals by DPWH Regional and District Engineering Offices

According to the questionnaire-based study conducted during the terminal evaluation (February 2010), 8 out of 10 field offices were referring to the technical standards, guidelines and manuals developed by FCSEC at that time. Although this result might not represent the average situation of the country considering the small number of responses, it can be observed that most of the field offices were using the guidelines and manuals. Therefore, it can be said that this indicator was largely achieved[29].

Although the first indicator was not sufficiently achieved, the second indicator was generally achieved. In addition, FCSEC's technical staff improved their technical skills to the extent that they would be able to lead flood control measures for small rivers and regular hydraulic experiments. Therefore, it can be judged that the project purpose has

[27] These experiments were conducted at the hydraulic laboratory building which was completed in 2002 with the "Project for Construction of Hydraulic Laboratory Building", Japan's grant aid project.
[28] However, they needed advice from Japanese experts if the experiment was complicated.
[29] As it will be discussed later in "3.2.2 Impact", presumably more field offices are currently utilizing the manuals at the time of the ex-post evaluation.

been largely achieved.

3.2.2. Impact

In 2008 DPWH commenced the preparation of M/P and F/S for 12 river basins nationwide. For this, a steering committee was established, and the Head of FCSEC was nominated as vice-chairperson. On the other hand, FCSEC's Project Manager was nominated as chairperson of the technical working group established for the M/P and F/S preparation. This means that a framework was established in which FCSEC could systematically provide technical inputs to DPWH's flood control projects. Additionally, after the completion of this project in June 2010, flood control related M/P and F/S implemented/supervised by DPWH were all handed over to FCSEC based on the memorandum issued on January 11, 2012. In other words, a system in which FCSEC technically assesses all flood control projects of DPWH has been established.

3.2.2.1. Achievement of Overall Goal

Overall Goal: "More effective and appropriately designed flood control and sabo structures/facilities plans are implemented by DPWH in accordance with the technical standards, guidelines and manuals developed by FCSEC"

As it will be explained below, the overall goal has been largely achieved.

1) Indicator 1: Number of flood control and sabo structures/facility that are designed and constructed in accordance with the technical standards, guidelines and manuals formulated and produced by FCSEC

Through the beneficiary survey, it was confirmed that more than 28 flood control and sabo structures have been newly designed or constructed in accordance with FCSEC's technical standards, guidelines and manuals. Some field offices have not been able to do so due to budget constraints. One example of a flood control structure which has been newly designed/constructed in accordance with FCSEC's technical standards, guidelines and manuals would be Digmala River, one of the pilot project sites. After the completion of the pilot project, DEO constructed concrete revetment (roughly 180 meters, with the construction cost of approximately 5 million peso, completed in March 2013) by requesting its own fund. According to DEO staff, they utilized FCSEC's technical standards and guidelines at each stage of the planning, construction and maintenance. It was also indicated that the structure was planned and designed based on scientific evidence by utilizing what they learned from the pilot project. Therefore, this can be considered as one of the positive impacts of this project.

2) Indicator 2: Disaster Mitigation Plans which reflected recommendations provided by FCSEC

FCSEC developed the National Flood Management Framework Plan (NFMFP) and presented it at the cabinet meeting of the National Disaster Coordinating Council (NDCC) in February 2006. According to the questionnaire answers, the plan was handed over to DENR-RBCO[30] and incorporated in the "Philippine River Basin Management and Development Master Plan." It was difficult to obtain accurate information on the status of the "Philippine River Basin Management and Development Master Plan" despite the fact that it was attempted during the evaluation study. On the other hand, information was available concerning the "Integrated River Basin Management Development M/P" which is being developed under the leadership of the DENR[31] at the time of the ex-post evaluation. DPWH is a member of the steering committee for the said M/P; and normally FCSEC staff members attend the meetings representing DPWH[32]. Based on the above fact, it can be interpreted that FCSEC's technical recommendations are incorporated in the disaster reduction plan of the Philippines through the said M/P and others. Therefore, it can be said that this indicator has been virtually achieved.

3.2.2.2. Other Impacts

3.2.2.2.1. Impact on Natural Environment

It was confirmed through the questionnaire and interviews that there was no negative impact on the natural environment in and around the pilot project sites.

3.2.2.2.2. Resettlement and Land Acquisition

Through the questionnaire, field visits and interviews, it was confirmed that there was some land acquisition. At the Kinanliman River pilot site in Real, Quezon, one landowner existed; thus FCSEC exchanged a memorandum of understanding with the LGU at the planning stage, explained the objectives, necessity and the implementation plan of the pilot project and obtained the landowner's consensus. As a result, the procedures went smoothly without any particular problem. There was no case of resettlement.

3.2.2.2.3. Other Indirect Impacts

1) Kinanliman River, one of the pilot project sites, used to change its course whenever

[30] RBCO was established by President Order 510 issued on March 5, 2006.

[31] According to the recent policy direction of the Philippines, flood control measures need to be planned and implemented within the framework of integrated river basin management and development. DENR coordinates flood control sector along with other sectors that are associated with river basins.

[32] For example, DENR held a steering committee meeting for the Integrated River Basin Management and Development M/P on April 10, 2014, and FCSEC staff attended the meeting representing DPWH.

there was heavy rain, and there was frequent flooding. According to the former chairperson of the barangay[33], the river which was 12-meter-wide almost doubled its width when a large-scale typhoon hit the area in 2004. Houses of roughly 300 households were destroyed, and they were forced to resettle. After the construction of the revetment by this project, the river never flooded until the time of the ex-post evaluation; and more than 2000 residents can live without worrying about river flooding.

2) Around Digmala River, which is one of the pilot project sites, residents used to be affected by flood almost every year. The situation was very serious as their houses would be under water for several months in a year[34]. After the construction of spur dikes and revetment by this project, the houses never flooded. When a fairly large-scale typhoon attacked the area recently in October 2013, water did not come to the houses. It was said that 20-30 households residing near the structures became able to live without fear thanks to this pilot project.

3) According to the questionnaire answers, there are some other cases: in one case revetment and spur dikes were constructed thereby bank erosion problem was addressed in Enrile; and in another case slope protection led to the mitigation of bank erosion at various sections in Cagayan and Parua River, Concepcion, Tarlac.

4) After the completion of this project, FCSEC staff took part in post-disaster rapid surveys as flood control experts in 2011 and 2012. It demonstrates that FCSEC's technologies and knowledge are utilized within and outside DPWH for disaster responses in the Philippines.

5) According to the questionnaire answers and the interviews with the implementing agency, FCSEC receives more than 5 requests for technical assistance every year from organizations other than DPWH at the time of the ex-post evaluation. In addition, FCSEC helped hydraulic experiments that were conducted by engineer-major university students in the country. Furthermore, FCSEC receives requests from LGUs for technical standards, guidelines and manuals. FCSEC also receives requests from community-based organizations and other concerned organizations to give lectures on flood control and sabo. Therefore, it can be observed that FCSEC is contributing to the flood control efforts of the country outside DPWH.

6) The preparation of M/P an F/S for the 12 river basins was on-going at the time of the project completion. At the time of the ex-post evaluation, M/P and F/S are completed for the 12 river basins plus 2 additional river basins, while 9 are on-going and 2 are being updated. Apart from this, 3 M/P and F/S are being developed by FCSEC in house[35]

[33] It is the smallest administrative division of the Philippines. It composes cities and municipalities and is equivalent to a village, district or ward.
[34] It is based on the resident interviews.
[35] Normally, a formulation of M/P and F/S is contracted out to a private firm. In this case, FCSEC developed

without contracting it out to private consulting firms. Base on the above, it can be observed that FCSEC's M/P and F/S supervision and implementation capability has improved steadily since the project completion, through which FCSEC is contributing to the construction of appropriate flood control structures.

7) Based on the instruction of DPWH Secretary, submission of the "Project Impact Assessment (PIA)" became mandatory for fund requests concerning flood control projects[36] after February 2014. PIA requires quantification of expected effects and impacts of the proposed flood control project, and to make the calculations, FCSEC's technical standards, guidelines and manuals need to be referred to. Therefore, FCSEC has been receiving many requests for the technical standards, guidelines and manuals. It can be observed that FCSEC's guidelines and manuals are widely utilized and contributing to the quality improvement of flood control projects after the project completion.

8) FCSEC's technical inputs were requested and incorporated in the development of PIA format. In addition, FCSEC is leading the planning and implementation of the PIA orientations that DPWH is organizing for field offices at the time of the ex-post evaluation. After the orientations it is likely that more detailed guidance on PIA preparation will be necessary, which FCSEC is expected to lead as well. Based on the above, FCSEC is making concrete contributions to the quality improvement of DPWH's flood control projects through PIA and others after the project completion.

9) As a result of the beneficiary survey targeting regional office and DEO staffs who participated in this project (43 responded out of the total beneficiaries of 270), the majority (76%) said that "FCSEC's technical support responded to the needs of their offices." Additionally, all the respondents (100%) said that "FCSEC was contributing to the nurturing of flood control experts in the Philippines." Furthermore, 76% indicated that they were "highly satisfied (22%)" or "satisfied with FCSEC (54%)." Similarly, 79% said that they were "highly satisfied (13%)" or "satisfied with this project (66%)." Based on the above results, it can be observed that the contributions of this project and FCSEC are well-received by field office staffs.

In light of the above, DPWH's flood management capacity was strengthened to a certain extent, as seen in the fact that FCSEC engineers became able to lead flood control measures for small rivers and regular hydraulic experiments. Thus it can be said that the project purpose was generally achieved by the time of the project completion. In addition, there are many cases in which effective flood control and sabo structures have been designed or constructed in accordance with FCSEC's technical standards, guidelines and

TOR, selects and procures consultants, supervises and controls the quality of the study.

[36] It is based on the memorandum issued on February 7, 2014.

manuals; thus the overall goal has been achieved. Furthermore, the project and FCSEC are well received by the field offices, and many other positive impacts are observed, while no particular negative impact is observed. This project has largely achieved the project purpose and the overall goal; therefore, effectiveness/impact of this project is high.

3.3. Efficiency (Rating: ②)

3.3.1. Inputs

Inputs	Plan	Actual
(1) Experts	・Long term experts in 4 different fields: 228 months in total (48 months for sabo expert, 180 months in total for experts other than sabo, 4 persons in total) ・Several short term experts	・Long term experts in 3 different fields: 170.2 months in total (49.4 months for sabo expert, 120.8 months in total for experts other than sabo, 6 persons in total) ・13 short term experts
(2) Trainees received	A few persons yearly	8 persons in total (main training fields: Hydraulic Model Experiment, Flood Control Administration, Research and Survey Management, Disaster Risk Management, River Information Management, etc.)
(3)Third-Country Training Programs	None	None
(4) Equipment	Main equipment: - Equipment for surveying and manual updating - Equipment for hydraulic experiments and research - Equipment for establishing information filing and dissemination system	Main equipment: mostly as listed on the left-hand column (approx. 5.3 million peso[37])

[37] It is equivalent to approx. 11.8 million yen if converted using the average rate for the project period, which is 1 peso = 2.23 yen.

Total Project Cost	approx. 370 million yen	approx. 390 million yen
Total Local Cost	Project Operation Cost: N/A Pilot Projects: 50 million peso[38] Total: N/A	Project Operation Cost: approx. 53 million peso[39] Pilot Projects: approx. 45 million peso[40] Total: 98 million peso (Total: approx. 219 million yen[41])

3.3.1.1. Elements of Inputs

Through the questionnaire and field interviews, it was confirmed that Japanese experts provided appropriate technical support. According to FCSEC staff, they were able to obtain practical knowledge by visiting sites together with the Japanese experts, observing the actual situations of the rivers and learning how to identify problems and measures to be taken. It was also said that FCSEC staff could immediately seek the Japanese experts' advice whenever they had doubts or questions in their work, and was able to carry out their duties with confidence. However, it was also pointed out that in some cases Japanese experts required time before beginning to demonstrate their best abilities due to language problems and different cultures. It was suggested that it might be worth considering assigning one person for more than 3 years[42] in the case of long-term experts.

As part of this project, 8 persons from DPWH attended different training courses in Japan. It was confirmed through the questionnaire and DPWH staff interviews that these training courses provided DPWH staff with valuable opportunities to experience high-standard technologies and management methods[43].

With regard to the equipment provided by this project, it was confirmed through the questionnaire and interviews that the procured equipment was generally utilized properly. Additionally, there were JICA long-term experts, apart from this project, who were

[38] It is equivalent to approx. 112 million yen if converted using the average rate for the project period, which is 1 peso = 2.23 yen.
[39] It is equivalent to approx. 118 million yen if converted using the average rate for the project period, which is 1 peso = 2.23 yen.
[40] According to JICA's document, the total fund contributed by the Philippine side to the pilot projects is 53 million peso. However, according to FCSEC, the fund contributed through the project is 45 million peso, and DEO secured and contributed additional 25 million peso for the Kinanliman River site. Therefore, there is a possibility that the total amount contributed by the Philippine side to the pilot projects is 70 million peso.
[41] The amount was calculated using the average exchange rate for the project period, which is 1 peso = 2.23 yen.
[42] However, in case long term experts are loaned by the ministries, system may not allow the assignment of one expert for more than 3 years. Moreover, there are benefits associated with replacing Japanese experts in the middle of the project because new perspectives and thinking can be introduced.
[43] According to the questionnaire answers and interviews with DPWH's Bureau of Design staff, sabo and coastal engineering are the two areas in which Japan is considered as one of the pioneers; thus great demand exists for training courses in Japan. Comments were received, requesting further technical assistance in these areas, such as trainings in Japan and dispatching experts.

assigned to DPWH during the implementation of this project. Synergy was observed between these experts and the project. For example, the experts had technical knowledge of flood control and were able to provide technical advice on FCSEC's studies and revision of the technical standards and guidelines. Because these experts belonged to DPWH headquarters, they advocated flood control measures promoted by FCSEC within the headquarters, liaising between FCSEC and DPWH headquarters in some cases.

3.3.1.2. Project Cost

The actual project cost was 390 million yen as compared to the plan of 370 million yen; thus it was higher than planned (105% of the plan). There is no clarity as to why the project cost exceeded the plan[44].

3.3.1.3. Period of Cooperation

The actual project period was 60 months (5 years) from July 2005 to June 2010, which was as per the plan.

The elements of inputs were appropriate for the outputs, and the project period was within the plan. Thanks to the collaboration between the Japanese experts and FCSEC staff, the outputs and the project purpose were generally achieved before the project completion. However, there were some periods during which the number of FCSEC engineers assigned to the project was fewer than planned[45]. Also, the execution of the project operation cost from the Philippine side tended to be delayed. Moreover, the project cost exceeded the plan. Therefore, the project was not necessarily efficient.

Although the project period was within the plan, the project cost exceeded the plan. Therefore, efficiency of the project is fair.

3.4. Sustainability (Rating: ②)

3.4.1. Related Policy towards the Project

At the time of the ex-post evaluation, the Philippine government formulated the "Philippine Development Plan" (2011-2016), which aims to "mitigate flood risk with river basin management and the development of efficient and appropriate infrastructures." In addition, DPWH's "Strategic Infrastructure Policies and Programs" (2012-2016)

[44] It was not clear from the documents provided by JICA. Related information could not be obtained from concerned JICA offices, either. Judging from the fact that the man-month (MM) of long-term experts was actually 170.2MM as compared to the plan of 228 MM, it is possible that short-term experts had to fill in the gap created by the reduced MM of long-term experts, as a result of which the cost became high.

[45] The number of FCSEC engineers assigned to handle the five project outputs were fewer than what would have been ideal; however, even with the limited number of FCSEC engineers, project outputs were mostly attained thanks to the strong participation of the DEOs for the pilot projects and the Training Division (AMMS) for the training.

identifies the "effective flood control program" as one of the 5 strategic programs. Therefore, this project continues to be consistent with the development and sector policy of the Philippines after the project completion.

While the necessity of flood control measures has long been recognized in the Philippines, it is increasingly becoming important and a policy priority after the project completion. During the field study, interviews were conducted with DPWH, the National Disaster Risk Reduction and Management Council (hereinafter referred to as "NDRRMC")[46], PAGASA, NWRB and JICA Philippine Office, and they all indicated that the need for flood control measures has been increasing in the country recently. This is because there is a growing focus on climate change issues globally, and the topic of disaster risk reduction and management is receiving increased attention. It is also because the country experienced a number of serious natural disasters in recent years including the super typhoon. According to the statistics of NDRRMC, on average there were 43 floods in a year during the project implementation period (2005-2010), whereas 142 floods were reported in 2012 alone, which is more than twice the yearly average. In addition, DPWH's flood control budget has been increasing in proportion to the total budget[47], which reflects the increasing importance of flood control within DPWH.

One of the factors that might have contributed to the increasing importance of flood control within DPWH is JICA's continuous effort. JICA Philippine Office meets with DPWH management semi-annually for the "Project Implementation Review" (hereinafter referred to as "PIR"). PIR is an occasion to discuss all JICA supported projects in the presence of DPWH Secretary. Through PIR, JICA continuously advocated the importance of flood control and promoted the idea of FCSEC's permanency after the completion of this project. In addition, JICA headquarters and JICA Philippine Office worked toward continued skill development of FCSEC staff by utilizing other JICA projects such as ODA loan projects and training scheme[48]. It seems that these efforts led to FCSEC's permanency, which will be discussed below. It is also possible that these efforts encouraged well-trained FCSEC staff to stay with DPWH.

3.4.2. Institutional Aspects of the Implementing Agency

The Department Order No. 87 was issued in September 2013, based on which the Flood Control Management Cluster (hereinafter referred to as "FCMC") was established under the Unified PMO. The mandate of FCMC is to oversee the entire flood control (including donor-supported and self-funded projects). The Department Order No. 107 was then

[46] It is administered by the OCD.
[47] It will be discussed in more details in "3.4.4 Financial Aspects of the Implementing Agency."
[48] For example, Japanese consultants assigned to the ODA loan project worked collaboratively with FCSEC staff. This way FCSEC staff had the opportunities to refresh their flood control knowledge.

issued in November 2013, based on which FCSEC was transformed to the Flood Control Management Office (hereinafter referred to as "FCMO"). At the time of the ex-post evaluation, FCMO has a permanent status within DPWH.

The responsibilities of FCMO have been certainly on the increase since the project completion. Based on the memorandum dated March 25, 2014, FCMO also became in charge of rural water supply projects[49], in addition to the tasks already mentioned above: (1) supervision of all M/P and F/S; (2) development and management of flood control related database; (3) PIA orientations; and (4) detailed guidance on PIA preparation.

On the other hand, FCMO has 7 engineers[50] apart from Project Manager at the time of the ex-post evaluation. It has been almost promised that these 7 engineers will be given permanent positions, and FCMO has a plan to recruit 3 young engineers (level 2, Job Order)[51]. In addition, there is a prospect that about 3 staff will be added (most likely Job Orders) given the significant expansion of FCMO's duties and responsibilities[52]. Therefore, it is possible that FCMO will be staffed with 13 engineers apart from Project Manager.

It can be interpreted that FCMO's responsibilities have been increasing because former FCSEC enhanced its capability through this project, which has its own significance. However, the reality faced by FCMO is that its staffing level is not keeping up with the increasing budget and workload. Although the number of staff is expected to increase in the near future, staff shortage is evident at the time of the ex-post evaluation. Therefore, it can be judged that there are some concerns in the institutional aspects of the implementing agency[53].

3.4.3. Technical Aspects of the Implementing Agency

Based on the questionnaire and the field study, it was confirmed that most of the former FCSEC staff members who developed skills through the previous project and this project are still working at DPWH at the time of the ex-post evaluation. Almost all the members, except for the ones who retired or emigrated aboard[54], are contributing to DPWH's flood

[49] The decision was made because FCSEC's Project Manager had prior working experience in water supply.
[50] The composition is 1 level-V engineer, 3 level-IV engineers and 3 level-III engineers. The levels represent hierarchies of engineers. There are five levels from level I (lowest) to level V (highest).
[51] At the time of the ex-post evaluation, they are trying to identify candidates who are suitable for the posts.
[52] According to FCMO's Project Manager, it has been orally promised by DPWH's management.
[53] It is right after the rationalization implementation, and there are ceilings to limit the number of permanent engineers within FCMC. Thus there are not many options at present other than filling the gap with contact employees. However, according to FCMC's Director, they "acknowledge the increasing workload of FCMO, and understand that staff shortage is an issue. It is possible to consider increasing the number of FCMO staff further, and if necessary, the idea of increasing the number of permanent staff can be considered in the future." Utilization and nurturing of human resources to be newly recruited would be necessary; the institutional aspects need strengthening in order to cope with the increasing amount of duties.
[54] Out of the engineers who existed during this project, one person retired, and another person immigrated aboard.

control management after the project completion. Therefore, it can be said that FCMO is equipped with sufficient technical levels.

In light of the above, most of the former FCSEC engineers who developed their skills through the project are most probably going to stay with DPWH as permanent employees; thus there are no major concerns in terms of technical sustainability. However, as the results of beneficiary survey indicated, there is a great demand for continuous flood control training for field offices. Additionally, the demand for coastal engineering is increasing due to the recent large-scale storm surge disasters[55]. There is an urgent need in the Philippines to nurture human resources in this field. Furthermore, with a view to developing human resources for the next generation, DPWH recognizes the need for a system in which FCMO's experienced engineers properly train and coach new young engineers to be recruited in the future. Therefore, it is recommended that efforts should be made toward further technical improvement.

3.4.4. Financial Aspects of the Implementing Agency

According to the data provided by the implementing agency, FCMO (former FCSEC)'s study budget has been increasing significantly in recent years: 13 million peso (2012), 97 million peso (2013), and 208 million peso (2014). In addition, DPWH's flood control budget has been increasing in proportion to the total budget (capital outlays): 6% (2010), 12% (2011), 11% (2012 and 2013), 18% (2014). According to FCMO's Project Manager, these budget levels are sufficient to carry out the required tasks; and therefore, it can be judged that there are no concerns with the financial aspects.

Some problems have been observed in terms of the institutional aspects of the implementing agency. Therefore, sustainability of the project effects is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1. Conclusion

This project aimed to strengthen the flood management function of DPWH through research and development, training, development of information management system, implementation of pilot projects and establishment of internal support system. The project is in line with the "Mid-Term Philippine Development Plan (2004-2010)", which places importance on expanding investment in flood control infrastructures. The project also responds to the needs of the Philippines to strengthen flood management functions because the country is affected by many natural disasters. Thus the project is consistent

[55] After the super typhoon, Typhoon Haiyan ("Typhoon Yolanda"), which attached the Philippines in November 2013 killing more than 6,000 people, there is an urgent need to strengthen measures against storm surge disasters in the Philippines.

with the Philippine development policy and needs. In addition, the project is consistent with Japan's ODA policy as it is in line with the "Country Assistance Plan for the Philippines". Therefore, relevance is high. Through this project, engineers at FCSEC became able to lead flood control for small rivers, and the targets for the project outputs and the project purpose were largely achieved. In addition, the project is contributing to the design and construction of appropriate flood control and sabo structures; thus effectiveness and impact are also high. Although the project period was within the plan, the project cost slightly exceeded the plan; thus efficiency is fair. The project remains consistent with the development policy and needs of the Philippines after the project completion. Most of the experienced engineers who accumulated knowledge and skills through this project are still working at DPWH, and flood control budget has been on the increase within DPWH; thus no problems are observed in the technical and financial aspects of the implementing agency. However, shortage of staff is evident in the implementing agency despite the fact that their responsibilities have been increasing; thus some problems are observed in terms of the institutional aspects of the implementing agency. Therefore, sustainability is fair.

In light of the above, this project is evaluated to be satisfactory.

4.2. Recommendations

4.2.1. Recommendations to the Implementing Agency

1) As one of the consequences of the steady improvement of FCMO's technical levels through this project, FCMO's responsibilities have been increasing significantly since the completion of this project. Financially, it has been addressed as FCMO's study budget has increased in recent years. Institutionally, however, the number of staff has not been increased since the project completion, and staff shortage is evident with respect to the ever-increasing workload. It is recommended that DPWH expedite the process of recruiting young engineers, as it is already approved. It is also recommended that FCMO should consider increasing the number of staff further to ensure that FCMO is institutionally sound for the expected workload.

2) It is recommended that FCMO should explore realistic and effective on-the-job training systems in which technologies are smoothly transferred from the experienced engineers to young engineers, thereby steadily developing human resources for the next generation.

3) With regard to one of the pilot project sites (sabo dam) where road embankment was not raised as per the initial plan, it is recommended that FCMO should coordinate with the Bureau of Quality and Safety and Nueva Vizcaya Sub DEO and promptly take appropriate measures to prevent the functions of the sabo dam and the road from being

compromised in the future.

4) It is recommended that DPWH continue organizing flood control training for field offices by utilizing FCMO staff and training materials developed/used by this project.

5) Although soil cement was piloted in this project, it is not listed in the "DPWH Standard Specifications" as DPWH's standard cost item. It is recommended that FCMO thoroughly discuss with the Bureau of Research and Standards and take necessary actions toward its approval.

4.2.2. Recommendations to JICA

1) Debris flow is one of the serious problems in the Philippines[56], and sabo is becoming widely recognized as one of the effective measures against debris flow. It is significant that FCSEC staff gained theoretical understanding of sabo and had the opportunity to put the knowledge into practice through the pilot project under Japanese experts' guidance. On the other hand, sabo is still a relatively new field in the Philippines, and it is only one pilot project that FCSEC staff got to experience from the planning stage. Thus more experiences are needed in the future. In particular, there is an urgent need to develop human resources who can handle detailed designs of sabo structures. DPWH is interested in learning further from Japan's experiences and cases because Japan is considered as one of the pioneers in the field of sabo. Therefore, it is recommended that JICA consider providing further training opportunities and dispatching experts in relation to sabo so that DPWH will eventually be able to manage detailed designs of sabo structures independently.

2) Due to the super typhoon in November 2013, there is an urgent need in the Philippines to prepare for storm surge disasters. Accordingly, it is viewed important to strengthen the country's coastal engineering capacity. Thus it is recommended that JICA consider the possibility of extending assistance to DPWH in the field of coastal engineering.

3) DPWH is envisaging the upgrade of the flood control database under the leadership of FCMO. The existing database contains information on locations and types of flood control structures that exist in the country and is mainly used to examine and manage the maintenance budgets for flood control projects. When the existing database was established, almost everything was done manually, including sending the request documents to field offices, collecting the documents, and inputting the collected information. Inevitably, it required significant amount of time, and data management is certainly not easy because updating the information will also require significant time and

[56] After the eruption of Mount Pinatubo in 1991, the area was devastated with mudflow called lahars. Because of such large-scale disasters, the need for debris flow measures began to be acknowledged in the Philippines.

efforts. At the time of the ex-post evaluation, better-scaled maps are available that did not exist at the time of the project implementation. Additionally, database related technologies have advanced greatly since the time of the project implementation. DPWH believes that more accurate and faster data gathering and uploading, along with on-line data sharing between multiple offices, will be possible with the utilization of GPS, GIS and mobile devices. While the database if upgraded can serve as a basis for future flood control projects, there is limited capacity within DPWH to fully utilize the above-mentioned new database technologies. Therefore, it is recommended that JICA explore the possibility of providing technical assistance in this field.

4.3. Lessons Learned

1) Pilot Project as an Effective Approach for Process-Focused Capability Building

A pilot project approach was taken in this project. It provided DPWH staff with the opportunity to experience the entire cycle of flood control projects under the guidance of Japanese experts, including planning, design, construction and maintenance. By putting the knowledge they obtained thus far into practice, DPWH staff members were able to acquire concrete skills. This project focused more on the “learning process” which was directly linked to the project purpose, rather than on the outcomes of the pilot projects. For such types of technical cooperation projects, it is thought that sound capacity building will be possible if the opportunity is provided by taking the pilot approach to “practice” the knowledge obtained through training and research.

2) Utilizing ODA Loan and Training Scheme for Technical Cooperation Projects

At the time of the completion of this project, there were concerns about the project’s sustainability. JICA Philippine Office utilized opportunities like PIR to discuss with the high officials of DPWH semi-annually and tried advocating the importance of flood control and FCSEC’s permanency. JICA headquarters also made efforts to utilize and nurture FCSEC staff continuously after the project completion by encouraging the collaboration between FCSEC and other projects such as ODA loan projects. These efforts seem to have achieved good results because FCSEC became a permanent office by the time of the ex-post evaluation, and FCSEC’s core members are still working at DPWH and contributing to the country’s flood control projects 4 years after the project completion. Therefore, it can be said that steady and continuous efforts—linking the project to new or on-going projects and utilizing various occasions to discuss with high officials of the implementing agency—are effective for completed projects that have sustainability issues.

Republic of the Philippines

Ex-Post Evaluation of Japanese Technical Cooperation Project:

"Information Technology Human Resource Development Project"

External Evaluator: Yuko Sugiyama, Octavia Japan Co., Ltd.

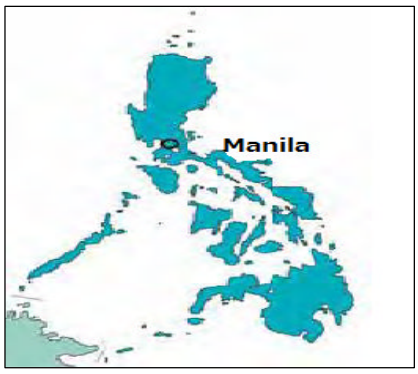
0. Summary

In order for the University of the Philippines Information Technology Training Institute (UP ITTC) to implement Information and Technology (IT) training efficiently for university graduates and IT engineers in a manner that will meet the needs of the IT industry, assistance for the development and implementation of the training courses, as well as industry collaboration, was conducted through this project. The purpose of this project was consistent with the development policies and needs of the Philippines, as well as Japanese aid policies. Thus the relevance of the project is high. Although the project purpose was achieved, the overall goal of 400 graduates per year was not achieved, due to the insufficient capacity of the facilities, a shift in focus away from the training centre to the development centre and a reduced number of scholarships. As a result, the effectiveness/impact of the project is considered to be fair.

Though the project costs fell within the proposed budget (86% of the overall outlay), the project period exceeded the project plan (125% of the original plan). Therefore, the efficiency of the project is considered fair. Regarding sustainability, no major problems were found in terms of the policy background, technical or financial aspects of the implementing agency. Some problems were observed in terms of institutional aspects, such as unclear divisions between the roles of the implementing agency and other concerned organizations, as well as weak collaboration with the IT industry in terms of scholarships. Therefore, the sustainability of the project is considered to be fair.

In light of the above, this project is evaluated as being partially satisfactory.

1. Project Description



(Project Location)

(Training room)

1.1 Background

In the Republic of the Philippines, the Information Technology and Electronic Commerce Council (ITECC) included the 'ITECC Strategic Roadmap 2003' as part of the 'Philippines National Science and Technology Plan'. In this Roadmap, programmes and activities in the field of IT promotion were suggested for implementation. The University of the Philippines (UP) in consideration of supporting the realization of the above mentioned 'ITECC Strategic Roadmap' set up a plan to establish the UP ITTC for the purpose of IT human resource development as part of its own science and technology park project, which promotes University-Industry partnerships, as well as the development of the IT industry.

Under these circumstances, the Philippine Government requested technical cooperation from Japan to establish the UP ITTC in April 2001. The request called for assistance in establishing a training centre that would implement IT training for 400 university graduates, in addition to providing transfer of the necessary skills and technology for the centre's operation to faculty members and counterparts (C/Ps)[1] at UP. Against this background, this project was initiated and expected to play a major role in IT human resource development in the Republic of the Philippines and to contribute to building University-Industry partnerships in the Philippines. The duration of the project was expected to be four years, starting from 20 July 2004. However, it was extended for one year after having received a recommendation from the terminal evaluation team. After JICA and UP signed the Record of Discussion (R/D) in June 2004, JICA began to dispatch Japanese experts in July 2004.[2]

[1] 'Counterparts' refers to individuals who are related to the project implementation.
[2] Source: Terminal Evaluation Report

1.2 Project Outline

Overall Goal		Skilled IT engineers with the potential to be core IT staff in the relevant business sector will be continuously supplied through the activities of UP ITTC.
Project Purpose		To provide university/college IT course graduates and IT engineers with the appropriate IT training courses for enhancing their skills and knowledge in order to meet the needs of the IT industry in the Philippines.
Outputs	Output 0	Organizational and operational functions of the project and UP ITTC are established and strengthened.
	Output 1	Teaching skills and knowledge of UP ITTC lecturers are improved for core IT courses, applications development, embedded systems and network systems.
	Output 2	Management capacity of UP ITTC is capable of providing IT training courses on its own in a sustainable manner, with satisfactory quality and corresponding to the needs of the IT industry (planning training courses, developing and revising curriculums, training materials and teaching methods).
	Output 3	Establish and maintain strong partnerships with the IT industry for curriculum development, sponsorship, employment opportunities, etc.
	Output 4	The project/UP ITCC are recognized as an IT training centre/institute.
Inputs		Japanese side: 1. Experts: 31 8 for Long-Term, 23 for Short-Term 2. 13 Trainees received (trainings in Japan) 3. Equipment 185 million yen 4. Local Cost 9.7 million yen Philippines side: (about 63 million yen) 1. Counterparts (about 20 million yen): Project Director, Project Manager, C/Ps, permanent staff, etc. 2. Land and facilities (about 3 million yen): Project Office, server room, training and development room, classrooms (4) 3. Local Cost (about 40 million yen): training and

	development costs, implementation costs, utility costs, etc.
Total cost	582 million yen
Period of Cooperation	R/D: July 2004 – July 2008 Extension Period: July 2008 – July 2009
Implementing Agency	University of the Philippines UP ITTC (changed to UP ITDC in 2012)
Cooperation Agency in Japan	Tokyo Institute of Technology, Center of the International Cooperation for Computerization
Related Projects	Advanced IT Human Resource Development Project (March 2010 – February 2011) (Technical Cooperation)

1.3 Outline of the Terminal Evaluation

1.3.1 Achievement of Project Purpose at the time of the Terminal Evaluation

It was confirmed that the management of the project/UP ITTC was stable, as an adequate budget had been proposed and executed from both the Philippines and Japanese sides during the project period. Additionally, an adequate number of full-time instructors, as well as part-time instructors, had been secured. In addition, 100% of the graduates were employed in IT related positions (in 2006 and 2007), while 82% of IT companies targeted in this survey (52 out of 66 companies) showed a high interest in employing UP ITTC graduates, according to an IT needs survey. In light of these results, the project purpose was expected to be achieved.

1.3.2 Achievement of Overall Goal at the time of the Terminal Evaluation

At the time of the terminal evaluation, the capacity of the UP ITTC for full-time course was 100 trainees per year and the facility, which is able to produce 400 graduates annually, was not prepared. Therefore, the achievement of the overall goal was expected to be low.

1.3.3 Recommendations at the time of the Terminal Evaluation

At the time of the terminal evaluation, the following recommendations were made to be implemented following project completion: 1) maintenance of training programmes; 2) maintenance of partnerships with the IT industry; 3) continuous fundraising activities, such as 'Youth Congress for Information Technology (Y4IT)[3]'; 4) allocation of team leaders for marketing and administrative teams; 5) strengthening of marketing activities for the IT industry; 6) consideration given to the dispatch of Japanese experts (in the field of equipment maintenance, curriculum formulation and industry collaboration).

[3] A conference that provides students in the Philippines with the opportunity to learn about various areas of IT from IT related people.

2. Outline of the Evaluation Study

2.1 External Evaluator

Yuko Sugiyama, Octavia Japan Co., Ltd.

2.2 Duration of Evaluation Study

Duration of the Study: November 2013 – September 2014

Duration of the Field Study: February 9-22 and April 21-27, 2014

2.3 Constraints during the Evaluation Study

In this ex-post evaluation survey, a beneficiary survey using questionnaires was conducted among UP ITTC graduates (who had graduated from 2008 to 2013) and IT companies that employed them in order to measure the project's outcomes. Questionnaires were sent to 215 graduates and 37 graduates responded. Additionally, questionnaires were sent to 22 IT companies, but only two valid responses were returned. The reasons for why IT companies did not reply were because the person in charge of Human Resource was absent, or that graduates had already left the companies and did not see any advantages in answering the questionnaires. Since there was difficulty in terms of collecting a significant number of questionnaires for statistical purposes, the data obtained through the interviews conducted with 11 companies during the study was utilized for analysis in this report.

3. Results of the Evaluation (Overall Rating: C[4])

3.1 Relevance (Rating: ③[5])

3.1.1 Relevance to the Development Plan of the Republic of the Philippines

IT was found to be pervasive in the Philippines to some extent. However, from an industry structure point of view, there was a tendency for a larger focus to be placed on hardware manufacturing and assembling, which requires comparatively easy yet labour-intensive work. Thus, the IT industry in the Philippines was found to be largely influenced by the economic trends within developed countries. In light of this, the IT industry in the Philippines needs to shift its focus to high-valued industries, such as software development. Concurrently, IT human resource development was found to be a major issue in the Philippines.

The Philippine Government made 'ITECC Roadmap 2003' a part of the 'Philippines National Science and Technology Plan' from 2001 to 2020. In this Roadmap, IT human resource development was set as one of the important issues needing to be addressed in

[4] A: Highly satisfactory; B: Satisfactory; C: Partially satisfactory; D: Unsatisfactory

[5] ③: High, ②: Fair, ①: Low

order for the Philippines to become a knowledge centre within Asia in the 21st century.[6] In addition, the 'ICT Strategic Roadmap for 2006-2010' was created in 2006 and IT human resource development was established as one of the Roadmap's important issues. Moreover, the 'Mid-term National Development Policy (2004-2010)' was set by National Economic Development Agency (NEDA), in order to supply stable human resources in terms of IT professionals. In this policy, it was recommended that IT industry promote the establishment of a human resource development programme in the field of software development, which is one of the five priority areas of IT promotion.[7] As stated above, the development of IT human resources in the Philippines with adequate skills and knowledge was set as one of the national priority issues from the beginning until the end of the project (2004-2009). Additionally, the activities for attaining the above-mentioned goal had been promoted during that time. Therefore, this project, which aimed to develop capable IT human resources, showed high relevance in terms of IT development policies in the Philippines.

3.1.2 Relevance to the Development Needs of the Republic of the Philippines

In order to forge an IT nation for economic development, it was necessary that the Philippines shift its subcontracting economic structure to focus on higher-valued IT industries such as software development. However, the level of IT engineers' skills in the Philippines was low and there was a gap in terms of quality human resources between the actual supply provided by educational institutions and the demand from within the IT industry. Although more than three million IT-related human resources were being developed annually in higher education and training institutions in the Philippines, a significant proportion of these trainings focused on programming and general software utilities. Furthermore, high quality training courses were seldom prepared at undergraduate level. To this end, UP, as an institution with the highest academic ability in the Philippines, drew up a plan to establish UP ITTC, in order to develop advanced and practical IT human resources targeting university graduates as part of its own programmes, thereby contributing to the achievement of the National Scientific Technology Plan[8]. As a result, it was concluded that the implementation of this project was consistent with the IT industry needs in the Philippines.

Even after the project started, the above-mentioned shortage of human resources continued to be an issue. However, BPO (Business Process Outsourcing)/ITO (Information Technology Outsourcing)[9] industries had developed radically, showing a

[6] Source: Implementing Study Report (Japanese)
[7] Source: Terminal Evaluation Report
[8] Source: Implementing Study Report (Japanese) and Terminal Evaluation Report
[9] Source: http://www.jetro.go.jp/jfile/report/05001603/SODEC%202009.pdf

high annual average growth rate of 42% from 2004 to 2008.[10] This accelerated the demand for human resources in the IT field. Therefore, even at the project's completion, it was considered that the supply of more human resources for meeting the increasing IT industry needs was essential. As such, it was confirmed that there was a need for high quality human resources at the time of project completion.[11]

3.1.3 Relevance to Japan's ODA Policy

Japanese Country Assistance Policy for Philippines in 2000 has raised 'strengthening economic structure for sustainable development and overcoming constraints towards economic growth' as priority issues and this project has contributed to this aim. Additionally, the JICA Country Programme for the Philippines has set the 'development of human resources and establishment of its system' as one of the priorities within the cooperation between the two countries. Thus, this project was implemented for contributing to human resource development in IT promotion. In addition, this project was requested in conjunction with the Kyusyu Okinawa Summit held in July 2000 and was consistent with the Japanese IT international strategy 'Asia IT Initiative (AITI)'[12]. As such, this project was considered to be consistent with Japanese ODA policies.

This project has been highly relevant to the IT development plan and development needs in the Philippines, as well as to Japan's ODA policy. Therefore, its relevance was concluded as having been high.

3.2 Effectiveness and Impact[13] (Rating :②)

3.2.1 Effectiveness

3.2.1.1 Project Output

1) *Output 0: Organizational and operational functions of the project and UP ITTC are established and strengthened.*

It was confirmed that indicators 0-1 to 0-3 had been achieved at the time of the project's completion; thus, it is considered that Output 0 had been achieved.

Indicator 0-1: various administrative items are traced and recorded with the establishment of a management system, staff and budget.

According to the Terminal Evaluation Report and interviews with the C/Ps, it was confirmed that various administrative items such as the list of equipment, accounting

[10] Source: Information Technology and Business Process Association of the Philippines (IBPAP)
[11] Source: Interviews with C/Ps, IT related institutions and IT companies
[12] By utilizing e-Learning, it is aimed to promote mutual economic development through developing IT engineers/professionals with advanced skills in the environment of Japanese language and through strengthening the partnership of IT industries in both countries.
[13] Sub-rating for Effectiveness is to be put with consideration of Impact.

report, organizational chart and list of officials were traced and recorded appropriately by the end of project completion. Thus, this indicator is considered to be achieved.

Indicator 0-2: personnel, facilities, equipment and a budget for training are appropriately secured.

According to the Terminal Evaluation Report and interviews with the C/Ps, it was confirmed that personnel, facilities, equipment and a budget for training had been appropriately allocated at the project's completion. This indicator was therefore considered as having been achieved.

Indicator 0-3: utilization/maintenance of installed machinery and equipment is recorded.

At the time of the terminal evaluation, it was confirmed that provided equipment was recorded in the Deed of Donation which was made by JICA and maintained by UP. Maintenance of the equipment was reported at every project meeting. According to the documents provided by JICA and the interviews conducted with C/Ps, this equipment was maintained appropriately up to the project's completion and handed over with following the signing between JICA and UP. Thus, this indicator is considered to have been achieved.

2) *Output 1: Teaching skills and knowledge of UP ITTC lecturers are improved for core IT courses, applications development, embedded systems and network systems.*

It was confirmed that indicators 1-1 and 1-2 had been achieved at the time of the project's completion; therefore, it is considered that the Output 1 had been achieved.

Indicator 1-1: technical knowledge and skills of C/Ps are improved through various trainings:

Different training methods for each specialization (IT core, application development, embedded systems and network systems) were conducted during the project period. Additionally, C/Ps commented that they had acquired sufficient technical knowledge and skills for conducting their own specific training through these training methods. This was particularly the case in the field of embedded systems, due to a lack of local experts. As such, the contribution of technical transfers on behalf of Japanese experts was significant. Thus, this indicator is considered to have been achieved.

Indicator 1-2: technical knowledge and skills of C/Ps are improved through technical transfer among C/Ps.

By conducting interviews with C/Ps, it was confirmed that when they received technical transfers from Japanese experts or when they attended external training sessions, internal training sessions were also conducted with other instructors during the project period in order to share the knowledge and skills acquired through the above occasions. Furthermore, a mutual evaluation system was established by observing their lessons.

Moreover, it was confirmed that some C/Ps had improved their skills through short-term courses provided by UP ITTC. Thus, the indicator is considered to have been achieved.

3) *Output 2: Management capacity of UP ITTC is capable of providing IT training courses on its own in a sustainable manner, with satisfactory quality and corresponding to the needs of the IT industry (planning training courses, developing and revising curriculums, training materials and teaching methods).*

It was confirmed that indicators 2-1 to 2-9 had been achieved at the time of the project's completion; therefore, it is considered that Output 2 had been achieved.

Indicator 2-1: overall training plan is created.

According to the interviews with C/Ps, a general assembly was conducted each year in which all the UP ITTC staff participated. During this assembly, an overall training plan (including seminar/event plan) was created. Thus, the indicator is considered to have been achieved.

Indicator 2-2: curriculum, teaching materials and a course guide within the guidelines for instructors of each course are developed, based on the overall training plan.

According to the documents provided by JICA and the interviews conducted with C/Ps, it was confirmed that a curriculum working group meeting (CWG meeting)[14] had been held periodically (half-yearly or yearly) for each subject during the project period. In these meetings, the development policy for the curriculum, training equipment and guidelines for the instructors of each course were decided upon and created after the meeting. Thus, the indicator is considered to have been achieved.

Indicator 2-3: conducting instructor training according to plan.

According to the Project Completion Report[15], 13 types of instructor training were conducted by local or Japanese experts as noted within the project plan.

Indicator 2-4: conducting training courses for a total of 1,700 participants: 200 full-time, 1,500 part-time (short courses).

The number of full-time course graduates was 27 (Year 2005[16]), 57 (2006), 74 (2007) and 63 (2008), which was 221 in total. This figure was beyond the indicator of 200. Additionally, the total number of participants in part-time courses (short-term courses) was 2,166 over four years, which exceeded the indicator of 1,500. Thus, this indicator is considered to have been achieved.

[14] During the project period, this meeting was conducted twice as 'Curriculum Working Group Task Force' (CWTF) during certain periods of time. However, both meetings had the same objectives.
[15] UP ITTC Final Report
[16] School Year 2005 refers to June 2005 – March 2006 (and similarly for dates following 2006).

Table 1: Full-time course graduates and participants in short-term courses

(Unit: persons)

Year	2005	2006	2007	2008	Total
Full-time course	27	57	74	63	221
Short-term course	71	435	771	889	2,166

Source: Answered questionnaire

Indicator 2-5: conducting special seminars several times annually to increase understanding of the project.

Y4IT was conducted each year during the project period. The number of participants was 5500 (Year 2004), 7500 (2005), 12,500 (2006), 16,000 (2007) and 18,000 (2008), which was 59 500 in total.[17] Additionally, according to the interviews with C/Ps, it was confirmed that UP ITTC staff participated in various seminars and meetings held in the Philippines and actively advertised UP ITTC. In addition, UP ITTC received visiting students on 'Educational Tours' and provided them with a briefing about course contents and other details. Furthermore, it was indicated in the Project Completion Report that instructors of UP ITTC had visited other universities where they had conducted various lectures related to IT (such as the roles of IT in the world market and network design). Thus, this indicator was considered to have been achieved.

Indicator 2-6: revision of courses based on the needs collected through course evaluation by participants and industry.

According to the interviews with C/Ps and the documents provided by JICA, a CWG meeting was conducted periodically for each specialization in the field of IT. In this meeting, results from the online survey completed by trainees and the needs of the IT industry were reflected to assist curriculum development and/or revision. Thus, this indicator is considered to have been achieved.

Indicator 2-7: evaluation guideline is prepared.

According to the interviews with C/Ps, evaluation guidelines for instructors were developed and distributed to all instructors. It was also confirmed that evaluation had been implemented based on said guidelines.

Indicator 2-8: more than 80% of participants in full-time and part-time courses are satisfied with the training.

According to the results of the beneficiary survey, 83% of the graduates who graduated prior to the project's completion responded that they were satisfied with the content of the training. Additionally, the interviews with graduates at the time of terminal evaluation and ex-post evaluation showed that most graduates commented that they were satisfied with

[17] Source: Answered questionnaire

the content of the training. Thus, this indicator is considered to have been achieved.

Indicator 2-9: the passing rate of the JITSE-Phil[18] examination for full-time course participants becomes higher than that of the average passing rate for the Philippines.

The passing rates for PhilNITS amongst UP ITTC trainees were 19.2% (2005), 35.1% (2006), 21.9% (2007) and 18.3% (2008). On the other hand, in the Philippines, these rates were 14%, 11%, 19.5% and 7.7% for each year, respectively. This shows that the passing rate of UP ITTC trainees exceeded that of the Philippines. Thus, this indicator is considered to have been achieved.

Table 2: The number of PhilNITS passers and passing rates

Year	Number of Passers	Passing rate of UP ITTC trainees	Passing rate of the Philippines
2005	5	19.2%	14%
2006	20	35.1%	11%
2007	16	21.9%	19.5%
2008	11	18.3%	7.7%

Source: Documents provided by PhilNITS, UP ITTC Final Report

4) *Output 3: Establish and maintain strong partnerships with the IT industry for curriculum development, sponsorship, employment opportunities, etc.*

While indicator 3-2 was achieved, indicators 3-1, 3-3, 3-4 and 3-5 were achieved only to a medium degree. Thus, the achievement level of Output 3 is considered to have been realized to a medium degree.

Indicator 3-1: a large number of job and scholarship opportunities are provided by IT-related companies for full-time course trainees.

The number of sponsors and scholarships was 7 companies/14 scholars (Year 2005), 19/34 (2006), 10/30 (2007) and 11/23 (2008) (see Table 3). Although UP ITTC secured scholarships from IT companies during the project period, the number for these scholarships began to decrease from 2007. Some of the C/Ps commented that the decrease in scholarships had been affected by the global economic depression. However, one of the interviewed companies providing sponsorship stated that follow-up of the outcomes of the scholarship by UP ITDC was not enough. This indicates that the decrease in scholarships cannot be attributed only to the economic depression, but perhaps also to some extent due to a lack of marketing on behalf of UP ITTC.[19] As shown in Table 4, employment rates for IT-related jobs were relatively high during the project period,

[18] The name was changed to the Philippine National IT Standards Foundation (PhilNITS) in August 2004.
[19] See '3-2-2. Impact' for details.

indicating that 79% of graduates contracted IT-related jobs[20]. Thus, the achievement level of this indicator is considered to have been achieved to a medium degree.

Table 3: Number of scholarships and sponsored companies during the project period

Year	2005	2006	2007	2008
Scholarships	14	34	30	23
Sponsored companies	7	19	10	11

Source: Answered questionnaire.

Table 4: Employment rates of graduates in IT-related companies

Year	2005	2006	2007	2008
Employment rate in IT related companies	79%	79%	79%	79%

Source: Answered questionnaire.

Indicator 3-2: IT engineers in private industries actively participate in teaching activities in UP ITTC.

Interviews with C/Ps indicated that a number of engineers from within the IT industry had opportunities to be instructors for full-time, as well as part-time course. Additionally, in order for trainees to have an opportunity to select their specialization, UP ITTC held lectures titled 'Career Talk', in which they invited individuals working in the IT industry to talk about their work. Thus, this indicator is considered to have been achieved.

Indicator 3-3: advisory board meetings are held at least twice annually.

The objective of the advisory board meetings (ITTC advisory committee) was to propose and make a request regarding the management and direction of UP ITTC in cooperation with representatives from the Philippine Government and the IT industry. These meetings were held with JCC[21] for a total of seven times by the project's completion. Since the project period was five years, the objective indicator (at least 10 times) was not achieved. Thus, the achievement level of this indicator is considered to have been achieved to a medium degree.

Indicator 3-4: curriculum working group meetings (CWG meetings) and industry collaboration working group meetings (ICWG meetings) are held according to plan.

According to the documents provided by JICA, although the CWG meetings were set out as a space for discussing the curriculum, it became difficult to cope with the

[20] Percentage of employed graduates amongst overall number of graduates per year.
[21] Joint Coordination Committee. All the stakeholders of the project gather and discuss project management in this meeting.

expanding scope of the discussions. Thus, these meetings were changed to curriculum working task force (CWTF) meetings and held for each specialization in association with participation from the IT industry. Once the curriculum had been confirmed, the CWTF meetings were abolished in March 2008. In October 2008, the CWG meetings were re-instated to discuss the full-time course curriculum. At the time of the project's completion, discussions about the curriculum were being held quarterly or half-yearly. ICWG meetings were aimed at promoting partnership between industry and academes and to report the results of the scholarship programmes to sponsors. Although this meeting was held four times in total, it had not been conducted since April 2006.[22] Therefore, the collaboration with IT industry was only at the CWG meeting since 2006. As CWG meeting was aimed to discuss about and develop the course which can meet IT industry needs, it is different from the aim of ICWG (request for sponsors and scholarships). Thus, the achievement level of this indicator is considered to be medium degree.

Indicator 3-5: donations from Industries are provided.

As mentioned in indicator 3-1, although UP ITTC annually obtained sponsorships from IT companies during the project period, the number of the scholarships started to decline year by year since 2007. Therefore, the achievement level of this indicator is considered to be medium degree.

5) *Output 4 : The project and UP ITCC is recognized as an IT training centre/institute.*

While the indicators 4-1, 4-3 and 4-4 were achieved, the achievement level of indicator 4-2 was medium degree. This output aimed to measure the recognition level of UP ITTC as a training centre/institute. Although achievement of indicators 4-3 and 4-4 shows that the recognition level of applicants was increased, it cannot be said that the recognition level of companies was increased as the indicator 4-2 shows the reduction of the sponsors and scholarships. Since increased recognition by companies as well as support for the trainees were considered to be indispensable for the sustainable management of the UP ITTC (UP ITDC) as a training centre/institute, the achievement level of Output 4 is considered to be medium degree.

Indicator 4-1: related documents are prepared as planed and the briefings are held.

According to the Terminal Evaluation Report and interviews with C/Ps, brochure, website and other advertisements (booklets, newspaper ad and guidebook for scholarship etc.) were prepared and used for advertisement. Also, UP ITTC set up its own booth at

[22] One of the documents provided by JICA indicated that ICWG was unified to a presentation session of the graduates. However, the main objective of the presentation was to gain recruitment from IT companies; as such, it could not function as a substitute for the ICWG meetings. Additionally, some C/Ps mentioned that the ICWG meetings had been abolished because they became less necessary. However, interviews with IT companies showed there was a request for providing follow-ups on scholarship programmes. Therefore, ICWG should have been necessary.

various conferences and exhibitions[23] and advertised UP ITTC extensively. In addition, for those companies which showed their interests in the scholarship programmes, UP ITTC conducted individual briefing about the programme. Thus, this indicator is considered to be achieved.

Indicator 4-2: number of prospected students and support for training increase every year.

As mentioned in indicator 3-1, the number of the sponsors and scholarships started to decline year by year since 2007. On the other hand, according to the interviews with C/Ps, a presentation of the trainees' projects (such as mobile applications) was conducted and many IT companies attended this presentation for the purpose of recruiting the graduates. Although this indicator is not achieved in terms of attainment of the scholarships, the other support like mentioned above was confirmed. Thus, the achievement level of this indicator is considered to be medium degree.

Indicator 4-3: recognition and interest in the project/ITTC are increased each year.

As shown in Table 5, the number of applicants for full-time course, participants in the short-term courses and participants in Y4IT increased during the project period. Therefore, this indicator is considered to have been achieved.

Table 5: Number of applicants for full-time course, participants of short-term courses and participants in Y4IT.

(Unit : persons)

Year	2005	2006	2007	2008
Applicants for full-time course	181	342	355	422
Participants in short-term course	71	435	771	889
Participants in Y4IT	7,500	12,500	16,000	18,000

Source: UP ITTC Final Report.

Indicator 4-4: applicant numbers become larger than available capacity (100).

As shown in Table 5, applicants for full-time course numbered 181 (Year 2005), 342 (2006), 355 (2007) and 422 (2008), which exceeded the indicator of 100 per year. Therefore, this indicator is considered to have been achieved.

[23] For example, PSITE (Philippines Society of Information Technology Educators).

3.2.1.2 Achievement of Project Purpose

Project purpose: to provide university/college IT course graduates and IT engineers with the appropriate IT training courses for enhancing their skills and knowledge in order to meet the needs of the IT industry in the Philippines.

1) Indicator 1: stable operation of the Project/ITTC with budget securement.

According to the interviews with C/Ps, management of the project/UP ITTC was stable and with appropriate budget execution during the project period. Thus, this indicator is considered to have been achieved.

2) Indicator 2: four ITTC full-time instructors and more than 30 part-time instructors are secured and will have the capacity for planning, developing and implementing training.

At the time of project completion, 10 full-time course instructors and 77 part-time instructors[24] had been secured. Additionally, it was confirmed that these instructors participated in CWG meetings and contributed to the planning, development and implementation of the training for both courses. Thus, this indicator is considered to have been achieved.

3) Indicator 3: more than 80% of UP ITTC graduates in full-time course to secure an IT-related position in the IT industry.

As show in Table 4, the employment rate for graduates was 79% every year from 2005 to 2008 according to the documents provided by UP ITTC. This indicates that the target rate of 80% had almost been achieved.

4) Indicator 4: more than 80% of participants and companies accept graduates and attach high value to the project/ITTC.

According to the interviews conducted with graduates, almost 80% answered that the training content had been useful to their current work. Furthermore, the results of the 'IT human resources needs survey' in 2008[25] revealed that more than 50% of companies that hired UP ITTC graduates evaluated the skills of these graduates at a higher level than those of graduates from other schools. In addition, the survey showed that 54 out of 66 companies (82%) were interested in employing UP ITTC graduates. Moreover, interviews with other stakeholders, in addition to a beneficiary survey, showed that the UP name, as well as the values and support provided by Japanese and/or other IT companies contributed significantly to the achievement of this indicator. Thus, this indicator is considered to have almost been achieved.

As it has been confirmed that all indicators had been achieved at the time of project completion, the project purpose is considered to have been achieved.

[24] Source: Part-time instructor list submitted by C/Ps at the time of ex-post evaluation.
[25] 'JICA UP ITTC IT Human Resources Needs Survey' (2008) conducted by Spiceworx.

3.2.2 Impact

3.2.2.1 Achievement of Overall Goal

Overall goal: skilled IT engineers with the potential to be core IT staff in the relevant business sector will be continuously supplied through the activities of UP ITTC.

1) Indicator 1: 400 graduates of full-time course are produced from UP ITTC and available for IT employment every year.

Table 1 shows the number of graduates during the project period, with Table 6 indicating the number of graduates from the project's completion up to the ex-post evaluation survey. As shown in these tables, 400 graduates were not produced every year, which had been the target number.

UP ITTC moved to the former National Scientific and Mathematic Educational Institute in the University of the Philippines Diliman (Vital A. Tan Hall) in March 2009[26]. However, the capacity of the new training facility is 150 maximum and does not have the capacity for producing 400 graduates every year. One of the reasons for not being able to prepare the training facility to produce 400 graduates each year – which was raised one of the issues to be addressed at the time of the terminal evaluation – was that the budget for new training facilities had not been secured following the project's completion. Another reason was that UP ITDC (formerly UP ITTC) had been so busy developing projects that their original role as a training institute had become less important.

Table 6: Number of full-time graduates following the project's completion.

(Unit: persons)

Year	2009	2010	2011	2012	2013
Number of graduates	56	83	74	58	55

Source: Answered questionnaire.

Additionally, as shown in Table 7, the number of scholarships has been decreasing each year following the project's completion and since 2010 no longer exists. Furthermore, no additional sponsor companies have been identified since 2011. The 60 scholarships in 2013 were provided by ICTO[27], with financial resources being supplied by the Philippine Government. Additionally, these scholarships were experimental and it remains under discussion whether they should be continuously provided.

[26] The capacity of the previous building was 100 trainees per year.

[27] Information and Communications Technology Office. One of the offices of the Department of Science and Technology (DOST)

Table 7: Number of scholarships and sponsored companies after the project's completion.

Year	2009	2010	2011	2012	2013
Scholarships	12	0	0	0	60
Sponsor companies	5	3	0	0	0

Source: Answered questionnaire.

Following the project's completion, CWG meetings have been held continuously[28]; therefore, partnership with IT industries in terms of curriculum revision has been achieved. On the other hand, since an ICWG meeting has not been held since 2007, active partnership with IT industries other than in the field of curriculum revision has not been conducted. According to the interviews conducted with C/Ps, the 'Business Development and Marketing Group' was formulated in 2011 and new actions for marketing have been initiated. However, as the team consists of only internal staff of UP ITDC (former UP ITTC), there remains an issue as it relates to a reflection of opinions and the needs of the IT industry. Furthermore, at the time of the ex-post evaluation survey, UP ITDC was unable to gain a complete picture of IT companies' satisfaction concerning the scholarships that they had provided in the past, as well as the current needs and trends within the IT industry. According to the interviews conducted with graduates, UP ITDC staff and current trainees, it was confirmed that expensive tuition fees were sometimes an obstacle for applicants to enter UP ITDC or for trainees to continue their studies. This issue has led to some graduates abandoning their degrees. In order to produce more graduates, the most important issue is strengthening partnerships with the IT industry.

In addition, as shown in Table 8, the number of full-time course applicants following the project's completion has decreased since 2010. Therefore, more effective marketing (attainment of scholarships and differentiation from other IT training institutions, etc.), as well as securing scholarships are considered to be of significant importance.

Table 8: Number of full-time course applicants following the project's completion.

(Unit: persons)

Year	2009	2010	2011	2012	2013
Number of applicants	500	322	255	121	94

Source: Answered questionnaire.

[28] See '3.4.2. Institutional aspect of the Implementing Agency' for details.

2) Indicator 2: graduates from the full-time course are recruited and employed as core IT engineers in IT industries.

The total number of full-time course graduates until the ex-post evaluation was 547 (see Tables 1 and 6). Interviews conducted with C/Ps, graduates and IT companies showed that most of these graduates worked as core IT engineers outside and inside the Philippines (see Tables 5 and 9 for employment rates of full-time course graduates in IT-related companies). Furthermore, according to the results of the beneficiary survey, around 86% of graduates answered that they were employed in an IT-related field and around 74% answered that the full-time course had been useful in obtaining IT-related jobs. Thus, this indicator is considered to have almost been achieved.

Table 9: Employment rate of full-time course graduates following the project's completion.

(Unit: persons)

Year	2009	2010	2011	2012	2013
Employment rates for IT companies	79%	79%	79%	79%	79%

Source: Answered questionnaire.

Although the project has achieved its overall goal as defined by target indicator 2, it has not achieved the goal set by target indicator 1, due to a lack of training facilities needed for producing 400 graduates per year. The qualitative impact on the IT industry was relatively large; however, there still remains an issue in terms of the quantitative impact. Therefore, the overall goal has not been achieved.

3.2.2.2 Challenges for continuously maintaining the project's effects

Considering the above mentioned situation regarding achievement of overall goal, there are three challenges that need to be addressed in order to maintain the project's effects and enhance its impacts.

1) Strengthening of marketing and partnerships with the IT industry

As stated above, partnerships between UP ITDC and the IT industry has become weaker after the project completion. 11 IT companies out of 11 interviewed (100%) showed a positive interest in collaborating with UP ITDC (such as scholarship programmes or the provision of OJT[29]). Additionally, 10 out of 11 companies (almost

[29] On the Job Training

90%) were satisfied with the skills of UP ITDC graduates and commented that they were willing to employ UP ITDC graduates. One company that was not satisfied with UP ITDC graduates commented that they would consider employment positively, depending on the marketing and skills quality of graduates as provided by UP ITDC. Furthermore, interviews with the Japan External Trade Organization (JETRO), ICTO and PhilNITS showed that the demand for IT human resources has been increasing yearly. There is therefore a high possibility for the UP ITDC to produce more effective candidates by conducting active market research and marketing. Currently, there is a number of IT training institutes in the Philippines. Therefore, it is necessary for the UP ITDC to differentiate itself from other training institutes and establish an organizational direction. In order to do this, it is of great importance that UP ITDC grasp the needs of IT industries and seek out effective collaboration with the IT industry. Therefore, the highest priority at this stage for the UP ITDC is to create a network with IT companies, including past sponsor companies and those companies where UP ITDC graduates are employed, and to set up a system for understanding the needs of the IT industry. Furthermore, it was found that some of the UP ITDC graduates were currently working as core IT engineers in other parts of the world. These graduates can attest to the high abilities of UP ITDC graduates, which can be a valuable marketing tool. It is therefore important that the marketing team conduct a follow-up survey of graduates to derive information about where they are employed, as well as their current situation as a whole. It is also necessary to make the strengths of UP ITDC clear in terms of its current curriculum and course characteristics.

2) Medium to long-term organizational plan

According to the UP Vice President for Development, UP ITDC aims to strengthen its role as a training institute and to expand its number of trainees. The challenges that UP ITDC currently faces are: 1) the leader of UP ITDC also serves as the leader of other organizations, which highlights a lack of steady leadership in UP ITDC[30]; 2) since its current facility is temporary, it is necessary for UP ITDC to build and move to a new facility in order to expand the institution's training functions on a full scale. UP Vice President for Development has realized these challenges and taken concrete actions to address them, including 1) the appointment of a new leader for UP ITDC; and 2) the preparation of new facilities[31] to attain the institution's goals. With regard to the first action, the necessary documents have been submitted and these are currently in the process of being reviewed. Regarding the second action, it has been confirmed from the interview conducted with UP Vice President for Development that the budget for the new

[30] See '3.4.2. Institutional aspects of the Implementing Agency' for details.
[31] This facility will not be for UP ITDC only, but for other UP Development Offices, too. The construction of this facility will be under the responsibility of the UP Vice President for Development.

facilities had been secured at the time of ex-post evaluation. Therefore, it is desirable that UP ITDC draw up a medium and long-term plan concerning target enrolments, the types of training they will be providing and the number of graduates they want to produce, which can be done by building partnerships with the IT industry and understanding the needs within the industry. Moreover, following the appointment of a new leader, implementation of the planned activities under strong leadership will be critical, with all staff sharing a common organizational goal.

3) Flexible response to a variety of needs

Once the expansion of the number of trainees has been achieved, it is advisable that UP ITDC respond flexibly to a variety of needs. The following are expected countermeasures to be taken in the future.

3-1) Consideration of setting courses based on trainees' abilities

According to the interviews with C/Ps, UP ITDC shortened the duration of its full-time course from one year to six months (three months for the IT core course and three more months for specialization) in June 2012 in order to reduce the financial burden on trainees and meet their requirements to be employed as soon as possible. This has meant that trainees learn their IT skills within a shorter period of time, as well as at a lower cost. However, according to the beneficiary survey (graduates), some complaints were highlighted, for example, that the pacing of classes was too hurried and that students should be considered in terms of their varying and individual skills. In addition, some IT companies that employed UP ITDC graduates mentioned that six months training was not enough for trainees to acquire practical IT skills and UP ITDC should return to the one-year course. As mentioned above, at the start of this project, university graduates from the Engineering Department and IT technicians were expected to be enrolees. In reality, however, students who graduated from non-engineering departments were also allowed to enrol if they were able to pass the entrance exam[32]. C/Ps commented that those individuals who achieved high scores on the aptitude test and who expressed a strong willingness to learn IT skills tended to graduate with higher performance, regardless of their IT-related knowledge. As a result, the institution made the decision not to narrow down their targeted enrolees, especially in terms of those who already had IT-related knowledge. According to the interviews conducted with graduates, some mentioned that trainees who did not have basic IT knowledge had difficulty understanding and acquiring the content of the lessons. To cope with this problem, UP ITDC tried setting different

[32] The entrance exam of UP ITDC（former UP ITTC）consists of 1) aptitude test (Mathematics, English and Logic); and 2) interview. An exam evaluating IT-related skills has not been conducted since the start of the project.

classes based on trainees' abilities. However, this attempt was discontinued, because they could not secure a sufficient number of students[33] for these classes. Thus, once the number of trainees expanded, setting different courses based on the trainees' needs and abilities (e.g., setting both one-year and six-months courses, with different classes based on students' abilities) is advisable. Companies that have acted as sponsors in the past also requested that separating classes based on the students' levels of knowledge should be considered.

3-2) Consideration of a Japanese language class

Although a Japanese language class had been compulsory during the project period, it has become optional since 2010[34]. According to the interviews conducted with graduates, the Japanese language class was one of the strengths of UP ITTC; however, learning both 'Japanese language' as well as 'IT skills' at the same time was hard for trainees who did not have basic IT knowledge. In fact, it was commented that there had been many drop-outs from the Japanese language class. On the other hand, the results of the beneficiary survey showed that the Japanese language class had been useful. This indicates that UP ITDC should also consider separating classes based on the trainees' needs and their Japanese language skills.

3-3) Provision of On the Job Training (OJT)

Many requests were raised from the interviews with graduates and current trainees to provide opportunities for applying acquired knowledge to real work as part of the course work. Additionally, the results of the beneficiary survey (graduates) showed that graduates expected UP ITDC to strengthen its partnerships with IT industries. According to the interviews conducted with IT companies, 11 out of 11 companies showed a positive attitude about accepting the OJT of UP ITDC trainees. Therefore, it would be desirable to provide the OJT in IT-related companies as a part of industry collaboration. OJT programmes can be a merit not only for trainees in terms of applying their acquired skills and knowledge within the real world, but also for the companies in terms of minimizing the process of recruiting new staff, in case they find a potential trainee who performs well through OJT. OJT should be considered as a different type of 'industrial collaboration' as 'industrial collaboration' should not be limited to a 'scholarship programme'.

3.2.2.3 Other Impacts

The number of participants in short-term courses was 2,166 during the project period and reached 7,096 at the time of ex-post evaluation. In addition, UP ITTC has implemented a number of consulting services and development projects with IT

[33] Class separation was implemented based on the trainees' performance in the aptitude tests conducted as part of the entrance exam. However, the number of enrolees was too small to continue the separation.
[34] Source: Interview with C/Ps.

companies and government agencies. In light of this, the implementation of short-term courses and IT development projects has impacted significantly on IT industries.

As this project has to some extent achieved its intended outcomes, project purpose, and overall goal, the effectiveness/impact of the project has been deemed as fair. While the project purpose was achieved, the achievement level of the overall goal was realized only at the medium-level, as the number of students did not reach the target set by indicator 1, while the goal set by indicator 2 had been largely achieved.

A provided PC

Provided servers

3.3 Efficiency (Rating: ②)

3.3.1 Inputs

Inputs	**Plan**	**Actual** (at the time of project completion)
(1) Experts	Four for Long-Term maximum 50M/M for Short-Term	8 for Long-Term; 23 for Short-Term (59.65M/M)
(2)Trainees received	A few trainees every year for the first three years.	13 in total
(3) Equipment	Equipment for the development of training; equipment for training (25 persons ×4 classrooms), etc.	PC, servers, equipment for network systems, etc.
Total Project Cost	680 million yen	582 million yen
Total Local Cost	63 million yen	63 million yen

Source: Documents provided by JICA and answered questionnaire.

3.3.1.1 Elements of Inputs

According to the interviews conducted with C/Ps, it was confirmed that necessary and sufficient equipment be provided in an effective manner. It was also confirmed from the interviews that the technical transfer of Japanese experts be successfully executed and that C/Ps utilize the acquired knowledge and skills at the time of ex-post evaluation. On the other hand, it was reported that some short-term experts had difficulty communicating with C/Ps due to the language barrier and they mentioned the importance of preparing translated manuals, guidelines and related documents for solving this problem. Furthermore, with regard to the training C/Ps received in Japan, they commented that most of this training comprised only a general overview of IT and that it would be much more effective if the number of sessions can be reduced and more focus be placed on IT specializations.

3.3.1.2 Project Cost

The project costs were lower than planned (86% of the planned cost).

3.3.1.3 Period of Cooperation

Since the project period was extended one year, the duration of the project was longer than initially planned (125% compared to the original plan). The extension of the project period was implemented to avoid the confusion created by moving to another building and to solve the issues concerning collaboration with IT industries and curriculum revision, which were raised at the time of the terminal evaluation. These concerns were solved by extending the project period and C/Ps commented that one year extension was appropriate. With regard to UP ITDC moving its facilities, this process had been conducted systematically since December 2008 and was completed in March 2009. These procedures were conducted smoothly and without any confusion.

Although the project cost was within the planned budget (86% of the original plan), the project period exceeded the plan (125% of the original plan). Therefore, efficiency of the project was rated as having been fair.

3.4 Sustainability (Rating:②)

3.4.1 Related Policy towards the Project

The Philippine Government has highlighted IT human resource development as one of the country's priorities in the current national development policy, 'Philippine National Development Plan 2011-2016'. In 2011, the 'Philippine Digital Strategy[35]' was also

[35] This was drawn up by the Commission for Information and Communications Technology (CICT) in 2011.

created as an IT master plan, along with the current national plan. In this policy, four top priority issues were raised for enhancing the expansion of IT/BPO industries. One of these issues was 'IT human resource development'.

As for the institutional aspect, UP ITTC became the first IT training institute certified ISO9001 in the Philippines in August 2009, which has improved its recognition level as a training institute. Although it was suggested that full-time course (without a degree) would be changed to a Masters' course or a course that would provide an optional degree following the project's completion, this was not achieved, as the University of the Philippines did not approve this. However, certificates are given to trainees who complete the UP ITDC (former UP ITTC) full-time course. At the present stage, the certificate is considered to have sufficient market value, partly due to the UP brand name.

In addition, at the time of the ex-post evaluation survey, organizational reinforcement of UP ITDC as a training institute (appointment of a new leader and relocation of the facilities to a new place which has better capacity) had been declared by UP Vice President for Development and concrete actions have been taken towards achieving this goal. Therefore, the sustainability of political aspects was considered not to be an influential factor.

3.4.2 Institutional Aspects of the Implementing Agency

1) Transformation of organizations following the project's completion

Following the project's completion, UP ITTC was supposed to be included in the 'National Engineering Centre (NEC)', under the direction of the UP Engineering Department. However, this plan was changed and UP ITTC instead came under the direction of the Office of the Vice President for Development of UP.

Additionally, following the project's completion, the UP System Information Technology Foundation (UP SITF), which had been part of UP ITTC, became independent. While the role of UP ITTC had been the management of full-time course and the implementation of governmental development projects, that of UP SITF had been to manage short-term courses, to conduct events such as Y4IT and to develop IT software. UP SITF had also been providing financial supporting to UP ITTC.

UP ITTC had been engaged in the management of the full-time course, IT development projects from government agencies and companies, as well as the 'eUP Project[36]7, which aims to build and develop information and communication technology within the UP system. As stated above, UP ITTC changed its name to UP ITDC with the expansion of its

CICT is a new organization, created as a substitute for ITECC, which aims to promote ICT national policies.

[36] The 'eUP Project', which was launched in 2012, is a project for unifying the ICT systems in all the universities under the UP system and to establish a basic structure for these systems. The project aims to improve efficiency in terms of services, research and guidance of students.

activities.[37] However, since UP ITDC had been busy with activities other than training, its role as a training institute has decreased. Considering these circumstances, the UP system demonstrated the policy for separating the 'eUP Project' and 'UP ITDC' since September 2013. Therefore, at the time of ex-post evaluation, three organizations, 'eUP Project', 'UP ITDC' and 'UP SITF' co-existed within the same building (see Table 10). It was found that command structure and the locus of responsibility was unclear within UP ITDC, for example, an overlapping of staff among these 3 organizations and a lack of a responsible individual for the marketing of UP ITDC and its collaboration with IT industries. In addition, the current leader of UP ITDC serves as a leader of the 'eUP Project', with more focus being placed on the 'eUP Project'. Having realized this situation, UP Vice President for Development demonstrated a policy for appointing a new leader for UP ITDC and promoting official procedures toward achieving this aim. Furthermore, it was announced that the 'eUP Project' will be a separate entity and will no longer be under the direction of UP Vice President for Development in the near future (April, 2014)[38]. Therefore, it is expected that the role division within the organization will become clearer once the appointment of a new leader and organizational change proceeds. Reinforcement of UP ITDC leadership is a key for the future management of UP ITDC.

Table 10: Role division of related organizations

Organization	Role
UP ITDC	Management of full-time course and implementation of development projects with government agencies and companies.
UP SITF	Management of short-term courses, organizing events such as Y4IT, development of IT software, etc. Financial support of UP ITDC.
eUP	Development and establishment of ICT systems within the UP system.

Source: Interviews with C/Ps

2) Industry Collaboration

From the completion of the project up to the time of ex-post evaluation (2009-2013), CWG meetings were held every six months for a total of seven times in conjunction with participants from within the IT industry. Therefore, industry collaboration in terms of

[37] The organization's name was changed because its purpose was shifted to being a 'Training and Development Centre' from simply being a 'Training Centre' （Interview with C/Ps and website: http://ittc.up.edu.ph/index.php/about-us/#sthash.LQc58MXV.dpuf）

[38] Source: interview with UP Vice President for Development.

curriculum has not posed any problems thus far. On the other hand, with regard to the implementation of marketing towards Japanese IT companies following the project's completion, which was one of the concerns raised at the terminal evaluation, the handover from a Japanese expert to UP ITDC staff who was responsible for industrial collaboration was conducted and this staff had engaged in the industry collaboration individually after the project completion. However, no-one has been allocated to take his place since the personnel resigned in 2012. As stated above, the number of scholarships has decreased and no additional companies (limited not only to Japanese companies) were offering scholarships at the time of ex-post evaluation. Currently, the initiatives are being undertaken to solicit scholarships from local government units (LGUs) and the efforts of securing TESDA[39] scholarships have been made. Also, efforts of activating industry collaboration have been confirmed as the 'Business Development and Marketing Group' was created in 2011. However, this team consists of internal staff of UP ITDC (former UP ITTC); there remain concerns in terms of accurately reflecting industry needs and opinions. Since industry collaboration is essential for sustaining the effects of this project, it is suggested that UP ITDC take strong measures to address this, such as allocating staff that specialize in this field (to contact past sponsor companies and graduates, etc.).

3) Management and Administrative System of UP ITDC

From the project's completion up to 2011, an advisory board meeting was held once a year in which management policies were discussed among the stakeholders. Since 2011, the advisory board meeting changed its name to the 'management committee', which meets once a month. Participants are invited to these meetings from within IT industries on a necessary basis.

With regard to the management of the full-time course, this has been conducted smoothly following the project's completion and UP ITDC managed to expand its variety of specialization courses. Therefore, the course management capacity of UP ITDC can be evaluated as having a high level of quality. Regarding the resignation of staff, sufficient handover (such as sharing necessary information, textbooks and guidelines) has been conducted. Furthermore, the development of newly recruited instructors has been conducted smoothly by distributing 'trainer kits' that provide training for new instructors and provides them with the opportunity to observe experienced instructors. Concurrently, the sustainability of institutional aspects does not appear to be a problem.

[39] Technical Education and Skills Development Authority

3.4.3 Technical Aspects of the Implementing Agency

UP ITDC has added short-term courses, as well as specialization subjects to the full-time course following the project's completion[40]. C/Ps commented that the biggest reason why the institution had managed to create these courses was that their IT-related capacity and knowledge had been improved by the technical transfer implemented during the project period. This highlights technical knowledge transfer as a result of the project to have had a significant impact in terms of improving C/Ps' IT related skills. Additionally, UP ITDC instructors have been making an effort to improve their individual capacities for teaching through attending various training (including UP ITDC short-term courses), purchasing related books, information gathering through the Internet and by studying at graduate school level in order to secure updated information sources, which can be substituted for Japanese experts. UP ITDC has established its supporting system in order to improve its instructors' technical skills, for example, through financial support for purchasing the necessary texts, exemption of short-term course tuition fees and financial support for payment of half of the tuition fees for graduate school.[41] In addition, in order to improve the technical skills of instructors, evaluation within the organization (instructors evaluate one another by observing their lessons, etc.) is also taking place. Considering the above, sustainability in terms of technical aspects showed no problems at the time of ex-post evaluation.

3.4.4 Financial Aspects of the Implementing Agency

It was confirmed that budget resources for the management of UP ITDC had been obtained from the tuition fees of the full-time course, application development projects and IT consulting services at the time of the ex-post evaluation survey. Additionally, UP SITF supports UP ITDC financially by raising money from events such as Y4IT, the implementation of development projects with IT companies and the management of short-term courses. UP SITF secured a budget for the maintenance and renewal of necessary UP ITDC equipment, as well as a loan for UP ITDC staff. Revenue in 2012 was approximately 42 million Philippine peso and spending roughly 39 million peso, raising around 3 million peso profit. The profit was saved to utilize for investment in development projects and the expansion of future activities. Therefore, sustainability in terms of financial aspects is considered to be fair.

Some issues have been observed in terms of the institutional aspects of the

[40] At the time of ex-post evaluation, three more specialization courses ('Enterprise Resource Planning', 'Game Design Development' and 'Mobile Application Development') had been newly created in addition to the three courses that were being provided at the time of the project's completion ('Application Development', 'Embedded Systems' and 'Network Systems').

[41] Source: Interview with C/Ps.

implementing agency, such as an unclear division of roles between the implementing agency and other concerned organization, as well as weaker collaboration with the IT industry in terms of scholarships. Therefore, the sustainability of the project's effects has been rated as fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

In order for UP ITTC to implement IT training efficiently for university graduates and IT engineers in a manner that will meet the needs of the IT industry, assistance for the development and implementation of the training courses, as well as industry collaboration, was conducted through this project. The purpose of this project was consistent with the development policies and needs of the Philippines, as well as Japanese aid policies. Thus the relevance of the project is high. Although the project purpose was achieved, the overall goal of 400 graduates per year was not achieved, due to the insufficient capacity of the facilities, a shift in focus away from the training centre to the development centre and a reduced number of scholarships. As a result, the effectiveness/impact of the project is considered to be fair.

Though the project costs fell within the proposed budget (86% of the overall outlay), the project period exceeded the project plan (125% of the original plan). Therefore, the efficiency of the project is considered fair. Regarding sustainability, no major problems were found in terms of the policy background, technical or financial aspects of the implementing agency. Some problems were observed in terms of institutional aspects, such as unclear divisions between the roles of the implementing agency and other concerned organizations, as well as weak collaboration with the IT industry in terms of scholarships. Therefore, the sustainability of the project were considered to be fair.

In light of the above, this project was evaluated as being partially satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

1) Strengthening of partnerships with IT industries and marketing

At the time of the ex-post evaluation, UP ITDC did not grasp very well about the satisfaction of the past scholarship programmes, nor did it exhibit a clear understanding of the current needs of the IT industry. On the other hand, 100% of the companies interviewed answered that they were willing to collaborate with UP ITDC (for example, by providing scholarships and OJT). Therefore, it is a top priority for UP ITDC to build a system that will enable it to better understand the industry's needs and to do so by networking with IT companies, including the past sponsor companies, as well as

companies that currently employ UP ITDC graduates. Furthermore, it is of great importance for UP ITDC to conduct a follow-up survey among graduates to collect information about their work environments and activities in order to observe the outcomes of the training the institution provides, as well as to expand their networks within the IT industry. In addition, for the expansion of the number of enrolees, establishing the strengths of UP ITDC in terms of its current curriculum and the characteristics of its courses is paramount.

2) Medium to long-term organizational plan

According to the UP Vice President for Development, UP ITDC aims to strengthen its role as a training institute and therefore to expand its number of trainees. In order to attain this goal, concrete actions have been taken, such as the appointment of new leader of UP ITDC and moving the institute to new facilities. In the future, it is desirable for UP ITDC to make sure the above-mentioned plans are implemented and to set a medium to long-term organizational plan by building the network with IT industry and grasping its needs.

3) Flexible response to a variety of needs

Once the expansion of the number of trainees has been achieved, it is advisable that UP ITDC respond flexibly to a variety of needs. The following are suggested countermeasures to be taken in the future.

1. Consideration of setting courses based on trainees' abilities

Once the number of trainees in UP ITDC has been expanded, setting different courses based on the trainees' needs and abilities (e.g., setting both one-year and six-months courses or to setting classes with different contents based on their abilities) is advisable.

2. Consideration for re-instating the Japanese language class

According to the interviews conducted with graduates, learning both Japanese and IT skills posed difficulties for trainees who did not already have basic IT knowledge. Trainees commented that many students dropped out of the Japanese language class. Nonetheless, the Japanese language class was rated as one of the strengths of UP ITTC. It is therefore suggested that UP ITDC also considers separating classes based on the trainees' needs and their Japanese language skills.

3. Provision of OJT

Considering the requests of graduates, current trainees and IT companies, it is desirable to provide OJT in IT-related companies for a certain period of time as part of industry collaboration. OJT programmes can be a merit not only for trainees in terms of applying their acquired skills and knowledge in the real world, but also for the companies in terms

of minimizing the process of recruiting new staff in case they find a potential trainee who performs well through OJT. Additionally, OJT should be considered as a different type of ‘industrial collaboration’ as ‘industrial collaboration’ should not be limited to a ‘scholarship programme’.

4.2.2 Recommendation to JICA

None.

4.3 Lessons Learned

1) Importance of sharing organizational goals among stakeholders

One of the factors that regularly hindered the attainment of the overall goal of this project was that the original organizational goal of being a ‘training institute’ gradually became weaker with the expansion of development projects. In order to sustain the effects of the project, it is desirable to implement its activities within the context of its original goal. However, since the needs and conditions of the industry and the market are likely to change, it is not always recommended that an organization continues to pursue its original goal. Therefore, it might be a good measure to review and revise the organization's goal according to the market needs on a necessary basis. It is also of great importance for the organization's staff to share the common goal and direction of the organization, and to do so under strong leadership. UP ITDC stated that this ex-post evaluation survey provided them with a good opportunity to review the institution's organizational goal. Therefore, in this and other similar projects, it is essential to regularly review organizational activities and to share the direction that the institution wishes to pursue among all staff members.

2) Continuous implementation of the customer satisfaction survey and building a contact system

In this ex-post evaluation survey, the beneficiary survey for graduates and IT companies had been particularly difficult to conduct. The biggest reason for this was that UP ITDC has little contact with graduates and IT companies. In order to measure the effects of the institution's training and the project, it is of great importance to create networks with graduates and IT companies. This contact system will also facilitate marketing and networking with IT industries.