

Ex-ante Evaluation

1. Name of the Project

Country: Republic of the Philippines

Project: Flood Risk Management Project for Cagayan River, Tagoloan River and Imus River

Loan Agreement: 30 March 2012

Loan Amount: 7,546 million yen

Borrower: The Government of the Republic of the Philippines

2. Background and Necessity of the Project

(1) Current State and Issues of Disaster Risk Reduction and Management (Flood. Management) in the Philippines

The Philippines is one of the most disaster-prone countries in the world. Especially, typhoon/storm and flood cause significant human and economic damages, exerting serious impacts on the economic activities. Furthermore, climate change is expected to further increase flood risk caused by typhoons and storms. On the other hand, due to financial constraints, the government has been able to implement fully-fledged flood control measures only in limited areas, leaving many high risk river basins in provincial areas without effective measures. Since flooding causes substantial damages around the Philippines every year, It is very urgent issue to expand target river basins and implement effective flood control measures.

Cagayan river basin (northeastern Luzon), Tagoloan river basin (northern Mindana) and Imus river basin (adjacent to the south part of Metro Manila) respectively have large granary, industrial corridor and special economic zone as mentioned below and are important areas for food supply and industrial growth for the Philippines. Prioritizing these areas, flood control measures have been prepared, but have not been put into practice. Frequent floods and vulnerability to floods hamper economic activities and the implementation of development policy in the region. Thus, flood control is the most urgent issue facing the government of the Philippines and the region.

- 1) Cagayan river basin: The biggest river in the Philippines that flows through large granary in the central Luzon island. Tuguegarao City, the political and economic center of the river basin, and Municipality of Enrile adjacent to the Tuguegarao City suffer from frequent floods. Especially, large-scale bank erosion destroys and damages people's properties including land and other assets, and can be a deterrent to socio-economic activities, such as road blockage. Therefore, implementation of measures against the bank erosion is urgently needed.
 - 2) Tagoloan river basin: Situated in the northern part of Mindanao Island. In the lower Tagoloan river is an industrial estate developed by Philippine Veterans Industrial Development Corporation (PHIVIDEC). The elimination of the area's vulnerability to flooding is especially important for the area's development through industrialization, which the government of the Philippines aims to achieve.
 - 3) Imus river basin: One of the areas with significantly high growth rate. In the close vicinity, there is a special economic zone into which many Japanese firms have advanced. The low-lying area of the river basin suffers from chronic inundation, which exerts impacts on the economic activities.
- (2) Development Policies for Disaster Risk Reduction and Management (Flood. Management) and the priority of this project

In the Philippine Development Plan (2011-2016), the government of the Philippines lists river basin management for flood risk mitigation and the effective and appropriate infrastructures development among its key policies. The strategies mentioned in the development plan prioritize the construction of flood management

structures in highly vulnerable areas, the application of Climate Change Adaptation (CCA) in the planning and design of flood management structures and the implementation of flood risk reduction and management for both structural and non-structural measures. Therefore, This is a priority project in line with the policy of the government of the Philippines.

(3) Japan's and JICA's Policy and the Past Activities of the Disaster Risk Reduction and Management (Flood Management) in the Philippines

Japan's Country Assistance Program for the Republic of the Philippines (June 2008) sets "Expansion of Basic Social Services (Improvement of the Living Conditions of the Poor)" as one of its priority development issues, and focuses on "Protecting Life From Natural Disasters". Under the policy it indicates Japan prioritizes supporting the development, maintenance and management of flood control and sabo (erosion control) infrastructure in high priority sites, as well as strengthening disaster preparedness including evacuation plans. In Response to it, JICA prioritizes both structural and non-structural measures and non to mitigate damages to be caused by natural disasters. In addition, in Japan-Philippines Joint Statement announced in September 2011, the both countries confirmed further expansion of bilateral cooperation in the field of disaster risk reduction and management.

Over 30 years since 1970's, Japan has continued to provide a wide range of assistances for the Philippines, especially flood control measures including making plans of flood control measures and its implementation, and technical cooperation for the central government, focusing on Metro Manila where due to its population density huge socio-economic damage is expected once flooding occurs and large rivers.

(4) Assistance from Other Development Partners

The World Bank is conducting a Master Plan survey for flood control in Metro Manila. In addition, it pledged development policy loan with catastrophe deferred drawdown option (Cat DDO) in September 2011. The United Nations Development Programme (UNDP) and The Australian Agency for International Development (AusAID) have been supporting hazard mapping of the disaster-prone provinces.

(5) Necessity of the Project

This project aims to implement structural and non-structural measures of flood control for three priority river basins out of several flood-prone river basins without sufficient measures.. i.e. the Cagayan River, Tagoloan River and Imus River, considering their importance in terms of food supply and industrial growth. This project is in line with the issue for the development of the Philippines, the development policy of the Government of the Philippines and the project Implementation policies of both JICA and the Government of Japan. Therefore, JICA's support to this project is necessary and valid.

3. Project Description

(1) Project Objectives :

The objective of the Project is to mitigate flood damage in the selected core areas in Cagayan river basin, Tagoloan river basin and Imus river basin in the Philippines by implementing structural and non-structural measures against flood, and thereby contributing to the sustainable and stable economic development and climate change adaptation in the target areas.

(2) Project site/Target Area:

Cagayan River basin (Cagayan province in Luzon Island), Tagoloan River basin (Misamis Oriental province in Mindanao Island), and Imus River basin (Cavite province in Luzon Island)

(3) Project Outline :

- 1) Civil works (bank protection, the construction of embankment/drainage facilities, retarding basin, and excavation, etc.)

- 2) Consulting service (Detailed design, bid assistance, construction supervision, planning & implementation support for non-structural measure etc.),
- (4) Total Project Cost:
10,113 million yen (Yen loan amount: 7,546 million yen)
- (5) Project Implementation Schedule:
March 2012 – May 2018 (75 months) The completion of the engineering works (April 2017) shall be the time of the project's completion
- (6) Project Implementation Structure
 - 1) Borrower: The Government of the Republic of the Philippines
 - 2) Project Executing Agency: Department of Public Works and Highways (DPWH)
 - 3) Operation and Maintenance System: Local Government Units (However, DPWH is responsible for works requiring large-scale rehabilitation.)
- (7) Environmental and Social Consideration, Poverty Reduction and Social Development:
 - 1) Environmental and Social Consideration
 - ① Category: B
 - ② Reason for Categorization: This project is categorized as B because it does not apply to large-scaled projects of the road sectors under the “Japan Bank for International Cooperation Guidelines for Confirmation of Environmental and Social Considerations” (April 2002), and will not include sensitive sectors, characteristics and areas under the guideline.
 - ③ Environmental Permit: Initial Environmental Examination (IEE) for the sub-projects for the Tagoloan river was approved by DENR and Environmental Compliance Certificate (ECC) has been issued. IEE for the sub project regarding the Cagayan river has been prepared, which is expected to receive approval from DENR by the time of Loan Agreement effectuation in 2012. The government of the Philippines is currently preparing Environmental Impact Statement (EIS) regarding the Imus river, and as soon as it is completed, application for the issue of ECC will be made.
 - ④ Anti-Pollution Measures: Air pollution (dust and exhaust gas) during the construction will be minimized by sprinkling water on excavated soil and installing exhaust muffler to truck, and noises and vibrations will be minimized by restricting night-time construction. Temporary water pollution will be minimized by setting up small scale closing levee and/or pollution control film. Note that the sub project for the Imus river does not expect any water pollution.
 - ⑤ Natural Environment: In the sub projects for the Cagayan River and Tagoloan River, digging could cause temporary changes in streams of the rivers, though in a small scale. Small scale closing levee and/or pollution control film will be used to minimize such effects.
 - ⑥ Social Environment: The sub projects for the Cagayan River, Tagoloan River and Imus River require the resettlements of 29 households, 1 household and 7 households respectively and the land acquisitions of approximately 53.9ha, 30.9ha and 51.5ha respectively. The procedure of resettlement and land acquisition will be conducted in accordance with the procedures stipulated in the domestic laws and regulations and the respective sub projects' Resettlement Action Plan (RAP).
 - ⑦ Other/Monitoring: DPWH will monitor resettlement, water quality, noises & vibrations and air pollution in this project.
 - 2) Promotion of Poverty Reduction: The unemployed applicants in and near the project site will be preferentially hired for the construction, and thus, an increase in job opportunity for the surrounding residents is expected.
 - 3) Promotion of Social Development: Gender perspective will be included in the planning and

implementation of non structure measure (hazard map, etc.)

(8) Cooperation with other schemes and/or donors: The project plans to utilize DPWH's Flood Control and Sabo Engineering Center (FCSEC), for which JICA provided support for the capacity development of organizations/human resources in its technical cooperation project.

(9) Other Important Issues:

In the vicinities of the Tagoloan River basins and Imus River basins, there are an industrial estate and special economic zone into which Japanese firms have advanced. This project will provide flood protection to the logistics from the industrial estate and special economic zone to the nearby big cities and ports as well as the employees' residential areas and the commuter roads, thus contributing to the improvement of business environment and investment environment.

4. Outcome Targets

(1) Quantitative effects

1) Operation and Effect Indicator

Sub project	Indicator	Baseline (※1)	Target (2019) 【2 years after completion of the project】
Cagayan River	Annual maximum bank erosion at every site (m/year)	6-28 (Average)	0
Tagoloan River	Annual highest water-level at reference point (m) (※2)	-	-
	Annual maximum flooded area (km ²) (※3)	1.53 (※4)	0 (※4)
	Annual maximum households inundated by floods (household) (※3)	610 (※4)	0 (※4)
Imus River	Annual highest water-level at reference point (m) (※2)	-	-
	Annual maximum flooded area (km ²) (※3)	13.78 (※5)	12.46 (※5)
	Annual maximum households to be inundated by floods (household) (※3)	14,534 (※5)	13,838 (※5)

※1 : Since the timings of data acquisition differ at the respective rivers, each project has a different base year: Cagayan River: 2002, Tagoloan River: 2009, and Imus River: 2003.

※2 : Annual highest water-level at reference point is a monitoring indicator.

※3 : Regarding the target return period, 25 year is for the Tagoloan River and 10 year is for the Imus River.

※4 : The values exclusively for the respective flood control target areas in structure measures.

※5 : The figures are based on the current land use (as of the respective base years) and do not include future developments or population increases.

<References>

In addition, the following data regarding impacts will be checked before and after the project. Note that since these data are highly susceptible to external factors, they are used for reference only.

- ① Cagayan River: Gross Regional Domestic Product: (GRDP) in Region II.¹
- ② Tagoloan River: GRDP in Region X and manufacturing share of GRDP²
- ③ Imus River: GRDP in Region IV-A and manufacturing share of GRDP³

2) Internal Rate of Return:

This project's Economic Internal Rate of Return (EIRR) is calculated for each sub project, based on the conditions below.

Sub-project	EIRR	Conditions
Cagayan River	18.2%	<ul style="list-style-type: none"> ▪ Project Life: 50 years ▪ Cost: the project cost (excluding tax), operation and maintenance expenses ▪ Benefit: alleviation of bank erosion (land loss, property loss, etc.)
Tagoloan River	24.8%	<ul style="list-style-type: none"> ▪ Project Life: 50 years ▪ Cost: the project cost (excluding tax), operation and maintenance expenses ▪ Benefit: Reduction of flood/inundation damage
Imus River	18.6%	<ul style="list-style-type: none"> ▪ Project Life: 50 years ▪ Cost: the project cost (excluding tax), operation and maintenance expenses ▪ Benefit: Reduction of flood/inundation damage

(2) Qualitative Effects

The improvement in the living environment and quality of life of the local residents, the improvement in investment environment by the preservation of transport/logistics in the target areas, heightened awareness of the flood risk control by the local residents, improved preparation for flooding, better disaster prevention (flood forecasting and warning, evacuation activities), the enhancement of technical strength of executing agency regarding flood control measures and adaption of climate change.

5. External Conditions /Risk Control

Delay in project implementation due to natural disasters, and flood beyond the planned return period

6. Lessons Learned from Findings of Similar Projects Undertaken in the Past

Findings from the past flood controls projects indicate that 1) non-structural measures is required to make the structural measures such as facility construction more effective and efficient, 2) due preparation for land acquisition and coordination during project implementation are imperative for smooth project implementation, and 3) the central government should play a role, as necessary, for efficient operation/maintenance/management by the local governments.

Since this project aims to implement more effective and efficient flood control in rural areas, a comprehensive measures will be taken, combining the structural measure and the planning and support for the implementation of non-structural measure (hazard map, etc.) in consulting service. Since small scale resettlements and land acquisitions are expected in this project, JICA has been strengthening its cooperation with the local governments

¹ As of 2009, 28,157 million peso (1985 as the base year)

² As of 2009, 73,207 million peso and 16,250 million peso respectively (1985 as of the base year)

³ As of 2009, 165,572 million peso and 46,147 million peso respectively (1985 as the base year)

since the project's preliminary stage through feasibility study and dispatch of the experts. During the project implementation, it plans to help the stakeholders including project affected people understand the project through information campaign which is planned as one of non-structural measures. In addition, since the Local Government Units are responsible for operation/maintenance/management, cooperation among the related organizations will be strengthened, for instance, for the monitoring on operation/maintenance/management by the Flood Mitigation Committee which DPWH and the local government have agreed to establish.

7. Plans for Future Evaluation

(1) Indicators for Future Evaluation

1) Cagayan River sub project

① Annual maximum bank erosion at every site (m/year)

2) Tagoloan River sub project

① Annual highest water-level at reference point (m)

② Annual maximum flooded area (km²)

③ Annual maximum households to be inundated by floods (household)

3) Imus River sub project

① Annual highest water-level at reference point (m)

② Annual maximum flooded area (km²)

③ Annual maximum households to be inundated by floods (household)

(2) Timing of Next Evaluation

2 years after the completion of the project

END