

Ex-Ante Evaluation

Southeast Asia 5 Division

Southeast Asia and Pacific Department, JICA

1. Name of the Project

Country: The Republic of the Philippines

Project: Pasig-Marikina River Channel Improvement Project (Phase IV)

Loan Agreement: January 21, 2019

2. Background and Necessity of the Project

- (1) Current State and Issues of the Disaster Risk Reduction and Management (flood risk management) Sector in the Philippines and the Priority of the Project

The Philippines is one of the most disaster prone countries in the world. While Metro Manila is the center of politics, economy and culture of the Philippines where over 12.87 million people live, it is also at a high risk of the storm/typhoon-related disasters since it is located in a coastal low-lying area. Socio-economic activities have been seriously influenced by floods. The government of the Philippines has been continuing efforts to address this issue for more than 50 years through planning and implementation of drainage and measures against floods. Nevertheless, flood risk management in Metro Manila, including the Pasig-Marikina River, still has a long way to go since the plans still not have been completed and recent climate changes increase flood risks due to typhoons and storms. For instance, tropical storm Ondoy in 2009 caused major flooding over a wide area of Metro Manila due to the heavy rainfall (180-year level), resulting in serious damage to economic activities and loss of life. The economic and human damage included 4.9 million flood victims throughout the country, 464 deaths, and 104.9 billion yen in direct and indirect damages and losses. Therefore, flood risk management for the Pasig-Marikina River is more important and urgent than ever for the government of the Philippines.

Under the Philippine Development Plan (2017–2022), the government of the Philippines set a goal as a part of their key programs to reduce vulnerability and form safe and trusted regional communities against natural disasters. The Pasig-Marikina River Channel Improvement Project (Phase IV) (“the Project”) is defined and prioritized in the Public Investment Program (2017–2022).

- (2) Japan and JICA’s Policy and Operations in the Disaster Risk Reduction and Management (Flood Risk Management) Sector in the Philippines and the Priority of the Project

Defining “ensuring human security for inclusive growth” as a key area, the Country Assistance Policy for the Republic of the Philippines (April 2018) aims to provide assistance for developing both of the “hard” and “soft” infrastructure. The main focus of this policy is placed on overcoming vulnerabilities while stabilizing and strengthening the basis of people’s livelihoods, as well as on coping with disaster and environmental issues. The JICA Country Analysis Paper for the Philippines (November 2014) defines “overcoming vulnerabilities” as a key area. The analysis indicates that appropriate risk reduction and damage minimization should be addressed to cope with disasters. The paper aims to provide assistance from the perspectives of both hard infrastructure (promoting the construction of disaster risk reduction infrastructures) and soft infrastructure (strengthening the systems including disaster risk reduction plans and evacuation measures), thus the Project is consistent with this policy and analysis.

Japan has been continuing its support for the Philippines’ flood control measures in a wide

range of areas since the 1970s, including the formulation and implementation of flood control plans, helping with capacity development for flood and erosion control engineers in the central government by dispatching experts, and post disaster stand-by loan. Especially flood control measures on Metro Manila, following to the ODA loan project Manila and Suburbs Flood Control and Drainage Project in 1973, a number of assistance programs were continuously and repeatedly implemented such as “the Pasig River Improvement Project” (Construction of Mangahan Floodway) and “the Pasig-Marikina River Channel Improvement Project (Phase I-III)”. The Project is also considered part of these. Rehabilitation of the upper stream of the river is being implemented by the Philippines side using their own capital, and rehabilitation of the Pasig-Marikina River that flows through the metropolitan area will end upon completion of the Project. Support for the detailed design (D/D) for the project site is planned by JICA Grant Technical Assistance. The Project contributes to establish disaster-resistant communities through the implementation of flood control measures. Therefore, it is considered to contribute to Sustainable Development Goals (SDGs) 11 and 13.

(3) Other Donor’s Activities

In 2012, the World Bank (WB) reviewed their Master Plan for Flood Management in Metro Manila and Surrounding Areas, focusing on the protection of structures. They also executed a Feasibility Study (F/S) and detailed design from 2017 to 2018 for the construction of the Marikina Dam and retarding basin located in the upper stream of the Pasig-Marikina River. Together with the Project, the Pasig-Marikina river basin can be protected from 100-year floods upon completion of the dam and the retarding basin. In addition to these, another project to renew pump station facilities in Metro Manila is ongoing (2017–2024 (planned)), through co-financing with the Asian Infrastructure Investment Bank (AIIB).

3. Project Descriptions

(1) Project Objectives

The objective of the Project is to mitigate flood damages in Metro Manila caused by channel overflow of the Pasig-Marikina River by implementing river channel improvement works and constructing of a movable weir together with non-structural measures in consideration with the flood risk management, and thereby contributing to overcoming vulnerabilities and stabilizing livelihood and production basis of the said region.

(2) Project Site/Target Area

Metro Manila (population: about 12.87 million)

(3) Project Overview

- 1) Construction and rehabilitation of bank protection, dredging, and widening (about 8.0 km) from the lower stream of the Marikina River to the Marikina Bridge.
- 2) Construction of Control Gate(Marikina Control Gate Structure (MCGS))
- 3) Rebuilding of two floodgates and a bridge (about 30 meters in length) in the Mangahan floodway
- 4) Consulting services: reviewing of detailed design (D/D), bidding support, construction supervision, support to be given for the formulation and implementation of plans to take non-structural measures (e.g. hazard maps), environmental management and monitoring support, support for resettlement and its monitoring,

and technical training for executing agencies.

- (4) Estimated Project Cost (Loan Amount): 69,095 million yen (Loan Amount: 37,905 million yen)

- (5) Project Schedule

Planned between January 2019 and February 2027 (total of 98 months) Project completion is defined as the commencement of facility services (December 2025).

- (6) Project Implementation Structure

- 1) Borrower: the Government of the Republic of the Philippines
- 2) Guarantor: None
- 3) Executing Agency: Department of Public Works and Highways (DPWH)
- 4) Operation and Maintenance Agency: The DPWH shall operate, maintain, and manage the two floodgates, while the Metro Manila Development Authority (MMDA) shall take charge of structures developed by the Project other than those. Structures other than the floodgates are planned to be transferred from the DPWH (the executing agency) to the MMDA two years after completion of the Project (2027). However, until the MMDA secures the necessary personnel and budget, the DPWH shall continue operating, maintaining, and managing the facilities.

- (7) Collaboration and Division of Work with Other Projects and Donors

At the lower stream of the Project, a river rehabilitation project has already been completed under the Pasig-Marikina River Channel Improvement Project (Phase III) ("Phase III"). Flood damage in the heart of Metro Manila, which is densely populated and financial center of the country, is expected to be mitigated through river rehabilitation under the Project, adjustments to the proper amount of flow separation for floods using the Marikina Weir to be constructed, and river rehabilitation projects up to Phase III. Detailed design (D/D) is planned to be executed by JICA Grant Technical Assistance.

- (8) Environmental and Social Considerations/Poverty Reduction/Social Development

- 1) Environmental and Social Considerations

i. Category: A

ii. Reason for Categorization: The Project is likely to have significant adverse impacts due to its characteristics under the JICA guidelines for environmental and social considerations (April 2010) ("JICA Guidelines").

iii. Environmental Permit: The Environmental Impact Statement (EIS) Report on the Project was approved by the Department of Environment and Natural Resources in June 1998. Despite the supplement report to the EIS prepared by the DPWH in August 2018, the domestic laws of the Philippines do not require re-acquisition of the environmental permit.

iv. Anti-Pollution Measures: Impacts on air quality, noise, and vibration during construction shall be mitigated through implementation of water sprinkling and installation of dust coverings, periodic maintenance of equipment, and the installation of temporary fencing. The impact of muddy water generated from dredging should be limited due to flowing water, however, a method to install a protector sheet is planned

to be adopted. It is expected that dredge soil will be reused as landfilling material for lowlands other than the Project site, after completion of tests to verify lack of contamination; thus impact on the surplus soil shall be minimized. In addition, drainage discharged during processing dredged material will be disposed to meet the water quality criteria.

- v. Natural Environment: The Project site is not located in or around sensitive areas such as national parks, and adverse impact on the natural environment is assumed to be minimal.
 - vi. Social Environment: The Project will involve the acquisition of about 12.4 hectares, relocation of seven business operators, and resettlement of 13,596 households (about 58,300 persons) of informal settlers. The land acquisition and resettlement for the Project will be conducted in accordance with the procedures stipulated in laws and regulations of the Philippines, the Resettlement Action Plan (RAP), and the JICA Guidelines. At public consultation meetings with stakeholders, no objection to the Project was heard. In Pasig city, another resettlement program started before the start of the Project and targets informal settler families (within the Mangahan floodway: 2,494 households, along the Marikina River: 242 households) based on the domestic resettlement program. However, no deviation from the JICA Guidelines has been confirmed.
 - vii. Other/Monitoring: During the construction, DPWH and the contractors will monitor air quality, noise, vibration, waste quality, and dredge soil. The DPWH will monitor land acquisition, resettlement, and the income restoration efforts.
- 2) Cross-Cutting Issues: The Project helps mitigate the impact of floods due to climate change issues in an area where increasingly severe damage by cyclones is expected. Therefore, the Project contributes to climate change adaptation. The Project will include HIV/AIDS prevention measures during construction and considerations for persons with disabilities via non-structured measure.
 - 3) Gender Categorization: GI (S) Gender Activity Integration Project

<Activity Content and Reason for Classification>

The Project will include gender and diversity perspectives into public announcements and awareness raising activities to be conducted as a non-structural measure. Therefore, the Project is classified as Gender Activity Integration Project.

(9) Other Important Issues

The Project will use two advanced Japanese technologies: (1) Hat-type and H-shaped Combined Steel Sheet Piles (SSP) method with excellent transportability and reduced costs while maintaining strength compared to typical steel sheet - piles, and; (2) Vibro-Hammer Driving with Waterjet Technology that Japanese companies excel in, in order to satisfy environmental considerations such as vibration and noise control.

4. Targeted Outcomes

(1) Quantitative Effects

Performance Indicators (Operation and Effect Indicator)

| Indicator | Return Period | Baseline (2018 actual) ^{*3} [After completion of Phase III] | Target (2027) [Two years after project completion] |
|---|---------------|---|---|
| Annual maximum flow at the monitoring point (m ³ /s) ^{*1} | | 1,620 | — |
| Annual highest water level at the monitoring point (m) ^{*1} | | 19.7 | — |
| Maximum damage in the year (million peso) ^{*2} | 5-Year | 22,352 (Approx. 46,492 million yen) | 9,517 (Approx. 19,795 million yen) |
| | 10-Year | 33,083 (Approx. 68,812 million yen) | 10,085 (Approx. 20,976 million yen) |
| | 20-Year | 43,115 (Approx. 89,679 million yen) | 11,172 (Approx. 23,237 million yen) |
| | 30-Year | 50,449 (Approx. 104,933 million yen) | 12,360 (Approx. 25,708 million yen) |

Notes*:

1. Annual maximum flow and annual highest water level at the monitoring point are monitoring indicators.
2. This means the amount of damage to houses, buildings, and sales in the Pasig-Marikina River Basin.
3. The reference value reflects updates due to the impacts of climate change and overflow analysis outcomes.

(2) Qualitative Effects

Economic growth and employment promotion as a result of facilitated private investments thanks to an improved disaster preparedness environment

(3) Internal Rate of Return (IRR)

Based on the conditions indicated below, the Economic Internal Rate of Return (EIRR) of the Project is 14.8%. Note that a Financial Internal Rate of Return (FIRR) is not set since no income is involved.

[EIRR]

Cost: Project costs, operation and maintenance expenses (excluding taxes)

Benefit: mitigated damages

Project life: 50 years

5. Pre-conditions and Important Assumptions

None in particular

6. Lessons Learned from Past Projects

A lesson from the results of the Philippines' ex-post monitoring of a loan assistance project titled "the Metro Manila Flood Control Project-West Mangahan" was that clarifying role allocation (including finance work) among the execution agency, local governments, and other related institutions from the early stages of the Project is critical to ensuring its smooth operation when acquiring land and establishing operating, maintaining, and managing systems.

Since the interregional project site involves multiple local administrations and a massive resettlement of residents, an MOU will be established to specify the institutions involved and

the scope of roles allocated to the local governments involved. As a part of non-structural measures, the Project will revitalize the Flood Mitigation Committee established when Phase III was taking place to serve as a coordinator for the stakeholders, aiming to facilitate swift discussion between them.

7. Evaluation Results

The Project is in line with the development issues and development policies of the Philippines, and Japan and JICA's assistance policies and analysis results, and contributes to establish disaster-resistant communities through the implementation of flood control measures, and is considered to contribute to SDGs 11 and 13. The significance of supporting the Project is therefore high.

8. Plans for Future Evaluation

(1) Indicators for Future Evaluation:

Per 4. (1) to (3).

(2) Timing of Next Evaluation:

Two years after project completion

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