Ex-Ante Evaluation (for Japanese ODA Loan)

Southeast Asia Division 5, Southeast Asia and Pacific Department, Japan International Cooperation Agency

1. Name of the Project

(1) Country: The Republic of the Philippines (the Philippines)

(2) Project: Cavite Industrial Area Flood Risk Management Project (II)

(3) Project Site / Target Area: Cavite Province (Population: approximately 4.34 million) Loan Agreement: March 24, 2025

2. Background and Necessity of the Project

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

The Philippines is one of the countries with the highest natural disaster risk in the world (IFHV 2024). In particular, floods frequently occur due to typhoons or rainstorms, resulting in serious damage to human lives, assets, and economic activities, and it is anticipated that the risk of flooding due to the storm-related disasters will be increased in the future due to climate change. Notwithstanding the situation, insufficient measures are taken in many river basins due to budgetary and personnel limitations, causing many districts to suffer serious flood damage every year. The Philippines faces challenges in the expansion of basins subject to flood prevention projects and inefficient execution of those projects

Cavite Province (area: 1,447.5 km²), situated next to the southern part of the Manila metropolitan area, is a satellite city of manila and is experiencing rapid population growth and economic development. In recent years, Cavite Province has seen rapid residential land development as a bedroom community for residents commuting to Metro Manila, and its proximity to Manila's international airport and international port has made it the core of the Calabarzon region, an important development area in the Philippines. There exist 17economic zones in operation, in which 716 companies are in operation, and 167 or about 23% of them are Japanese companies. Three small and medium-sized rivers, the Imus river, San Juan river, and Canas river, run through Cavite province, and when major typhoons occur, flood damage is caused by overflow in the middle and lower reaches of these rivers (external flooding). For example, it is estimated that about 15,000 people were affected by the big typhoon Ulysses in 2020 and the damage to agriculture and infrastructure was about 1.5 billion yen (1 PHP = 2.67 yen)

(National Disaster Risk Reduction and Management Council 2021). In addition, in the downstream areas close to the coast, internal water does not drain to the river due to underdevelopment and disfunction of the drainage channels, reduced infiltration capacity due to land use change as well as tidal influence (internal flooding), which results in long-term flooding during rainy season every year. During typhoons in 2009 and 2013, flood inundation depths in Cavite industrial park reached 2 to 3 meters, causing extensive damage, including damage to stored materials and work equipment. Furthermore, the Malimango creek, which runs through the Cavite industrial park, suffers drainage failure during the rainy season almost every year, which causes rainwaterlogging and even shut down factory operations. These floods and inundation damage have not only disrupted people's lives, but have also caused economic losses due to inundation and malfunctioning of industrial parks and main roads. Moreover, as mentioned above, the area is undergoing significant land use changes due to damage in the future.

Given this situation, Government of the Republic of the Philippines has been continuously promoting flood control efforts for more than 50 years. JICA has so far conducted the Study on Comprehensive Flood Mitigation for Cavite Lowland Area (2009) on the formulation of a master plan for flood risk management and feasibility study (FS) for priority projects in basins of Imus river, San Juan river and Canas river. The master plan selected the project for construction of retarding pond in Imus river basin as one of the priority projects, and the retarding pond was constructed in Flood Risk Mgt. Project for Cagayan, Tagoloan & Imus Rivers. In addition, based on the said master plan study, the project for construction of retarding pond began in the San Juan river in 2014 with the self-financing of the government of the Philippines. The detailed design of the project was completed in 2021 and the construction is scheduled to be completed in 2029.

In the Philippine Development Plan (2023-2028), reducing vulnerability to natural disasters and building safe and resilient communities are highlighted as key strategies. The Cavite Industrial Area Flood Risk Management Project (II) (hereinafter referred to as "the Project") aims to mitigate flood risk through the construction of diversion channels as well as improvement of drainage channels and rivers. This Project is included in the Infrastructure Flagship Project defined by the Philippine government to promote the strategic development of high-priority infrastructure, positioning it as one of the most critical projects within the government. Furthermore, the Project aligns with the Philippines' Nationally Determined Contributions (NDC) under the Paris Agreement, which aims to address the impacts of climate change in disaster risk reduction, specifically targeting damages caused by typhoons and floods that are presumed to be

exacerbated by climate change.

(2) Japan's and JICA's Policy Cooperation Policy and Operations in the Disaster Risk Reduction and Management (Flood Risk Management) Sector

Japan's Country Assisstance Policy for the Republic of the Philippines (September 2023) emphasizes "Ensuring Human Security for Inclusive and Resilient Growth" as a key area of focus. It outlines cooperation aimed at overcoming vulnerabilities, stabilizing and strengthening livelihoods, and addressing social issues such as natural disasters, environmental challenges, and climate change. Additionally, the JICA Country Analysis Paper for the Republic of the Philippines (March 2024) identifies the need to address various natural disaster risks as a critical challenge for sustainable economic growth, proposing cooperation from both structural (e.g., river improvement) and non-structural measures (e.g., strengthening disaster prevention and evacuation plans). Furthermore, the Project aligns with "Realizing Pre-disaster Investments" under the cluster strategy "20. Disaster Risk Reduction through Pre-disaster Investment and Build Back Better" in JICA Global Agenda. The Project is consistent with these policies and analyses.

Moreover, from the standpoint of enhancing disaster prevention and response capabilities, and addressing climate change, the Project is positioned in a pillar "Addressing Challenges in an Indo-Pacific Way" under "Free and Open Indo-Pacific".

(3) Other Donors' Activities

No projects by other donor agencies in Cavite were identified, but the World Bank and Asian Infrastructure Investment Bank are implementing a project to upgrade pumping station facilities in Metro Manila (scheduled for 2017-2024).

3. Project Description

(1) Project Description

① Project Objective

The objective of the Project is to mitigate flood risk through the construction of flood protection measures in Cavite Province, thereby contributing to the sustainable and stable economic development in the area.

- 2 Project Components
 - Construction of San Juan Diversion Channel (2.6 km long), Construction of Maalimango Diversion I (0.522km long)
 - Construction of Maalimango Diversion II (2.27 km long), Maalimango Creek Improvement (1.1 km long), Rio Grande River and Ylang-Ylang River Improvement (6.2 km long), Development of Resettlement Site
 - Consulting services: Detailed design, Tender Assistance, Construction Supervision, Facilitation of Planning and Implementation of Non-Structural Measures, and Facilitation of implementation of Environmental Management Plan (EMP) and

Environmental Monitoring Plan (EMoP) and Resettlement Action Plan (RAP)

③ Project Beneficiaries (Target Group)

Residents in Cavite province (Population: approximately 4.34 million)

(2) Estimated Project Cost

59,083 million Japanese Yen (of which the present loan amount is 14,483 million Japanese Yen)

(3) Schedule

January 2019 – March 2032 (159 months). The commencement of the facility operation is considered as the completion of the Project (March 2031).

- (4) Project Implementation Structure
 - 1) Borrower: Government of the Republic of the Philippines
 - 2) Guarantor: None
 - 3) Executing Agency: Department of Public Works and Highways (DPWH)
 - 4) Operation and Maintenance System: The Cavite 1st Regional Office, DPWH, plays a key role in the maintenance of facilities under the supervision of the department and the 4A District Office having jurisdiction over the province. DPWH has experience in implementing numerous flood control projects and conducting operations and maintenance of river management facilities, and there are no technical concerns for them. In addition, operations and maintenance costs will be covered by the budget of DPWH. LGUs remove the garbage dumped into the river and drainage channels in accordance with the Memorandum of Agteement (MOA) agreed among the members of Flood Management Committee (FMC) such as DPWH, Cavite Provincial Government, and LGUs.
- (5) Collaboration and Sharing of Roles with Other Donors
 - Japan's Activity: A long-term expert in "Flood Management" (dispatched from the Water and Disaster Management Bureau of Ministry of Land, Infrastructure, Transport and Tourism), who has been dispatched to DPWH, will advise on the technical aspects of the Project, which is expected to ensure smooth implementation of the Project.
 - 2) Other Donors'Activity: No projects by other donor agencies in Cavite were identified, but the World Bank and Asian Infrastructure Investment Bank are implementing a project to upgrade pumping station facilities in Metro Manila (scheduled for 2017-2024).
- (6) Environmental and Social Consideration
 - ① Category: A

② Reason for Categorization: The Project falls into the River sector (located in a sensitive area and is likely to have significant adverse impact due to its characteristic) under the JICA Guidelines for Environmental and Social Considerations (April, 2010) (hereinafter referred to as "JICA Guidelines").

③ Environmental Permit: The Environmental Impact Statement (EIS) Report on the Project was approved by the Department of Environment and Natural Resources (DENR) in May 2017 and is still in effect as of October 2024. Moreover, EIS for development of resettlement site was also approved by DENR in March 2022 and it is still in effect as of October 2024.

- 4 Anti-Pollution Measures: The quality of water is expected not to degrade during work because the rivers are repaired during the dry season, the temporary closure of the rivers has a limited impact, and it is not expected to reduce the flow rate of the downstream area or to discharge a large amount of earth. Meanwhile, grit chambers and silt fences are used to prevent the water from being turbid. The Project or the surrounding local governments plan to reuse waste, provided that after checking whether the soil to be excavated or in the place to be dredged is polluted, the results show that the soil quality is suitable to reuse. If large-scale disposal of excavated or dredged soil is required, consultation with the Department of Envitoment and Natural Resources (DENR) will be conducted and an environmental impact assessment will be conducted in accordance with national laws in prior to the large-scale disposal. At the start of the Project, four publicly owned lands were identified as potential sites for disposal of overburden. However, in consideration of subsequent changes in land use policy, discussions with related local governments, the acceptable amount of soil and sand, and the distance to be transported, the most economical plan at the moment is being proceeded, which is to use the land adjacent to the west side of the downstream portion of the San Juan diversion channel as the disposal site. The effect of sediment at the mouth of the diversion canal on the landform during provision may be minimized through the regular removal of earth and the dredging of the river course.
- (5) 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. Planned measures include the application of a method that does not obstruct the flow of rivers and channels or the migration of fish; the design of a flood way to avoid the mangrove forest growing near the river mouth as much as possible; the afforestation of mangroves to compensate for cut ones; and the use of a work method of minimizing changes in bank slope.
 - 6 Social Environment:

The Project envisages the relocation of 1,079 households and the acquisition of 722 lots (48.34 ha), so they move and their sites are acquired according to the Philippine procedures and the resettlement action plan meeting the requirements set forth in the JICA Guidelines. Land acquisition for 28 lots (11.99 ha) of the 722 has already been conducted and completed, while the relocation of 1,079 households has not been implemented because the resettlement site is still under development. Community

consultations on the land acquisition were taken place to give an outline of the Project, compensation, and an overview of available support. At the consultations, the residents requested development of the new resettlement site. Accordingly, the Package 5 of the Project is developing the resettlement site for informal settlers near to the project site.

- ⑦ Other/Monitoring: During work, DPWH monitors the water quality and waste in the area surrounding the project site in accordance with environment management and monitoring plans. The department also monitors not only the progress of site acquisition and resettlement, but also livelihood recovery conditions. After the provision, the executing agency will monitor sediment at the diversion canal mouth.
- (7) Cross-Sectoral Issues
 - Climate Change Countermeasures: The Project contributes to flood control in an area where typhoon damage and other serious disasters are expected to increase due to the effects of climate change, therefore contributing to adaptation to climate change.
 - ② AIDS/HIV and Other Infectious Diseases Countermeasures: None
 - ③ Disability Consideration: None

(8) Gender Category

[Gender Cases] GI (S) (Significant)

<Details of Activities/Reason for Categorization>

In response to gender-based issues such as low participation of women in disaster management planning and management, the Project plans to promote women's participation in disaster recovery and reconstruction operations, implement environmental improvement of flood shelters from a gender perspective, and support women's employment in resettlement action plan. The results and progress will be monitored using indicators agreed upon in the appraisal (e.g., percentage of women's participation in planning, implementation, and evaluation (40%), etc.).

(9) Other Important Issues

The Project contributes to flood control in an area where typhoon damage and other serious disasters are expected to increase due to the effects of climate change, therefore contributing to adaptation to climate change.

4. Targeted Outcomes

(1) Quantitative Effects

1) Outcomes (Operation and Effect Indicators)

Indicators		Indicators			Baseline (Actual value in 2017)	Target (2031) [2 years after project completion]
San	Juan	Annual	maximum	number	7,032	0

River basin	ofInundated Houses by Levee Breach or Overflow		
Marimango Drainage Area	Annual Maximum Number of Inundated Houses by Levee Breach or Overflow in	1,207	0

(2) Qualitative Effects

The living and investing environments are improved, and adaptation to climate change is attained.

(3) Internal Rate of Return

Based on the assumptions listed below, the economic internal rate of return (EIRR) for the Project is 14.33%. Note that a Financial Internal Rate of Return (FIRR) is not set since no income is involved.

[EIRR]

Cost: Project Cost (excl. Tax), O&M Cost

Benefit: Mitigated damages

Project Life: 56 years

5. External Factors and Risk Control

- (1) Preconditions: None
- (2) External Factors: None

6. Lessons Learned from Past Projects

The ex-post evaluation of the "Metro Manila Flood Control Project-West of Mangahan" (evaluated in Japanese fiscal year 2010) identified that clarifying roles (including finance work) among the execution agency, local governments, and other related organizations from the early stages of the Project is critical to ensure its smooth operation regarding land acquisition and operation and maintenance system. ODA Grants for the Philippines called "the Project for Flood Mitigation in Ormoc City (Phase 2)" is a good example of the above lessons learned. The FMC, consisting of the implementing agency and the local governments, was established at an early stage of the project, and the division of work among the agencies was clarified. Furthermore, the local governments secured the necessary budget for maintenance and management, and appropriate maintenance and management were carried out.

In the Project, MOA specifying the division of responsibilities for resettlement site is being signed by the implementing agency and the local governments, and is currently being coordinated for signature. In Cavite Province, FMC was established for the Imus river basin when Flood Risk Mgt. Project for Cagayan, Tagoloan & Imus Rivers was implemented. In the Project, the FMC is operated, adding three municipalities from the project area. In the future,

the FMC will be expanded to include six more cities and towns to form the committee with members from all cities and towns in the Imus river, San Juan river, and Kanas river basins, which is expected to strengthen the operations and management system.

7. Evaluation Results

The Project aims to mitigate flood damages in Metro Manila caused by channel overflow of the Pasig-Marikina River, thereby contributing to the sustainable urban economic development of the said region. Therefore, the Project is aligned with the development policies of the Philippines, and both Japan's and JICA's cooperation policies and analysis. In addition, since it is considered that the Project will contribute to SDGs' Goal 11 (Make cities and human settlements inclusive, safe, resilient and sustainable) and 13 (Take urgent action to combat climate change and its impacts), there is a strong need to support the implementation of the Project.

8. Plan for Future Evaluation

- Indicators to be Used As indicated in Sections 4.
- (2) Future Evaluation ScheduleEx-post evaluation: 2 years after the project completion.

END

Attachment: Map of the Cavite Industrial Area Flood Risk Management Project (II)



Map of the Cavite Industrial Area Flood Risk Management Project (II)

Source: Cavite Industrial Area Flood Risk Management Project (II) Preparatory Survey Final Report