

Ex-Ante Evaluation (for Japanese ODA Loan)
Southeast Asia Division 2, Southeast Asia and Pacific Department
Japan International Cooperation Agency

1. Name of the Project

- (1) Country: Kingdom of Cambodia (Cambodia)
- (2) Project Site / Target Area: Phnom Penh City (population approx. 2.35 million)
- (3) Project: Flood Protection and Drainage Improvement Project in Phnom Penh Capital City (I)

Loan Agreement signing date : April 30, 2026

2. Background and Necessity of Project

- (1) Current State and Issues of Flood Protection Development and the Priority of the Project in Cambodia

Phnom Penh, the capital of the Kingdom of Cambodia (hereinafter referred to as “Cambodia”), is the administrative and economic center of the country, and its population has increased from 860,000 people in 1998 to 2.35 million people in 2024 (based on population censuses). Moreover, the administrative area of Phnom Penh City has expanded from approximately 376 km² in 2011 to approximately 678 km², and is experiencing rapid urbanization amid conversions of farmland, paddy fields, and wetlands into residential land, as well as ongoing construction of new towns and industrial parks. At the same time, inland flooding has become more widespread and prolonged due to a combination of flat terrain, frequent heavy rainfall driven by climate change, and inadequate drainage infrastructure. In 2020, Phnom Penh International Airport and its surrounding areas, located in the southwestern part of the city that has undergone rapid urbanization, were affected by delays in the development of drainage infrastructure, leading to widespread flooding lasting up to 20 days, with damage confirmed over an area as large as 1,638 ha. In particular, areas with flooding depths of 80 cm or more experienced prolonged flooding lasting more than 96 hours, with approximately 100,000 households suffering damage, and 40,000 people being forced to evacuate. The direct economic impact is estimated to have risen to approximately 20 million USD (according to the Royal University of Phnom Penh). In response to the extensive damage, the National Development Plan “Pentagonal Strategy - Phase I” (2023–2028) was formulated in August 2023, highlighting the importance of drainage and flood protection measures designed to promote water resources management that is both sustainable and resilient to climate change.

In the southwestern part of Phnom Penh City, which is located close to the city center, new residential areas are currently being developed. Furthermore, National Road No. 3 and No. 4, which run adjacent to the target drainage areas, are considered vital logistics routes that connect to Sihanoukville, the site of Cambodia's only deep-water port. Therefore, the Phnom Penh Flood Protection and Drainage Improvement Project in Phnom Penh Capital City (I) (hereinafter referred to as "the Project") is expected to contribute to the promotion of sustainable urban development and economic activity in Phnom Penh City, Cambodia's economic hub, by developing important drainage facilities in the southwestern part of the city.

(2) Japan's and JICA's Cooperation Policy and Operations in the Flood Protection Sector

In 1999 and 2016, JICA conducted "Phnom Penh City Urban Drainage and Flood Protection Planning Studies," leading to the formulation of a Master Plan. In accordance with the above, JICA developed drainage facilities in the central urban area of Phnom Penh City through the Grant Aid project "The Project for Flood Protection and Drainage Improvement in Phnom Penh Capital City (Phases I–IV)" (2001–2022).

Japan's Country Assistance Policy for Cambodia (April 2024) identifies support for living environments of Urban areas, which includes drainage, as a key element for realizing the priority area of achieving sustainable and equitable growth. Additionally, the JICA Country Analysis Paper for Cambodia (January 2025) analyzes that increasing drainage facilities capable of coping with urban expansion and changes in rainfall patterns is an urgent priority. The Project is also aligned with the promotion of structural measures to support national infrastructure in JICA's Global Agenda (Thematic Project Strategy) and the realization of proactive investment in disaster risk reduction in the Cluster Strategy, and is consistent with these policies, analyses, and strategies. In addition, the Project will contribute to adequate drainage and help minimize inland flooding damage. From the perspective of providing support to reduce losses and damage to countries vulnerable to the impact of climate change and damage from natural disasters, the Project is positioned as a pillar of the initiatives for addressing challenges in an Indo-Pacific way under the Free and Open Indo-Pacific (FOIP).

(3) Other Donor's Activities

The Asian Development Bank (ADB) has implemented renovations of the

Trabek Pumping Station and Drainage Channel in the “Phnom Penh Water Supply and Drainage Project (1998–2003),” while the French Development Agency (AFD) has implemented environmental improvement measures and other initiatives, including drainage pipe rehabilitation around Phnom Penh City’s Central Market in the “Central Market Renovation Project” (2008–2010). These projects have been connected to the drainage network that Japan has supported through Grant Aid projects.

3. Project Description

(1) Project Description

- ① Project Objective: The objective of the Project is to enhance stormwater drainage capacity and mitigate flood damage by developing and rehabilitating drainage facilities in the southwestern area of Phnom Penh, thereby contributing to improving the quality of life and promoting industrial development in Phnom Penh.
- ② Project Components:
 - i) Construction of drainage channel (construction of a new box culvert and rehabilitation of concrete sheet piles)
 - ii) Construction of drainage channel (rehabilitation of open channel)
 - iii) Construction of drainage facilities (retention basin [18 ha] and drainage pumping station [discharge volume of 20 m³/sec])
 - iv) Procurement of equipment for drainage channel operation and maintenance
 - v) Consulting services (detailed design services, bidding assistance, construction supervision, support for improving operation and maintenance capacity, creation and release of hazard maps, planning of evacuation routes and training, etc.)
- ③ Project Beneficiaries (Target Group)
 - 1) Direct beneficiaries: Residents of the target area for drainage facility development (approximately 170,000 people), public facilities, and private companies
 - 2) Final beneficiaries: Entire drainage area under the jurisdiction of the Phnom Penh Capital Administration (PPCA) (approximately 2.35 million people in Phnom Penh)

(2) Estimated Project Cost: 22,367 million yen (of which 6,908 million yen is covered by Japanese ODA loan for the Project)

(3) Schedule: Planned to be implemented from April 2026 to December 2033 (93 months in total). The Project shall be deemed complete upon the start of facility operation (December 2032).

(4) Project Implementation Structure

- 1) Borrower: The Royal Government of Cambodia
- 2) Guarantor: N/A
- 3) Executing Agency: Phnom Penh Capital Administration
- 4) Operation and Maintenance Organization: Department of Public Works and Transport

(5) Collaboration and Sharing of Roles with Other Projects and Donors: N/A

(6) Environmental and Social Consideration

1) Environmental and Social Consideration

- ① Category: B
- ② Reason for Categorization: The Project is not located in a sensitive area, nor has it sensitive characteristics, nor falls it into sensitive sectors under the “JICA Guidelines for Environmental and Social Considerations” (issued in April 2010), and the adverse environmental impacts have been judged to be not significant.
- ③ Environmental Permit: The draft Initial Environmental Impact Assessment (IEIA) report has been prepared in Cambodia’s official language (Khmer) and in English. After review by the PPCA, it was submitted to the Ministry of the Environment (MoE), and it was approved by MoE in August 2025.
- ④ Anti-Pollution Measures: Adverse environmental impacts are expected to be minimal as the contractor will take measures to ensure that air quality, water quality, waste, noise, etc., during construction meet the domestic emission standards and environmental standards of Cambodia.
- ⑤ Natural Environment: The project target area does not fall within or near environmentally sensitive areas such as national parks, and adverse environmental and social impacts are expected to be minimal.
- ⑥ Social Environment: The Project involves the acquisition of approximately 19 ha of land and the involuntary resettlement of 32 people (nine households). Acquisition will proceed in accordance with a resettlement plan prepared in line with national procedures and the JICA Guidelines for Environmental and Social Considerations. In consultations with residents regarding resettlement, questions were asked about the

Project and compensation details, but there were no particular objections to the Project.

⑦ Other/Monitoring: Water quality, waste, noise and vibration, etc., will be monitored by the contractor during construction under oversight of the executing agency, and by the executing agency after commencement of operation. Furthermore, to address leachate from the Dangkor Landfill, which is located near the drainage channel to be rehabilitated in the Project, water quality testing will be conducted prior to the construction and also quarterly during the construction period, so the water quality will be regularly monitored.

(7) Cross-Sectoral Issues:

1) Climate Change and Biodiversity

The Project aligns with Cambodia's targets under its Nationally Determined Contribution (NDC) pursuant to the Paris Agreement, which calls for strengthening disaster prevention functions to address the risk of increasingly frequent extreme weather phenomena, such as heavy rainfall and flooding associated with climate change. Furthermore, the contributions of the Project in terms of reductions in flooding damage that is worsening due to increasingly intense heavy rainfall and other factors associated with climate change may also contribute to climate change adaptation.

(8) Gender Category: [Not Applicable] ■ GI (Gender Mainstreaming Needs Assessment/Analysis Project)

<Details of Activities/Reason for Categorization> Although a gender survey was conducted as part of the preparatory survey for cooperation, no initiatives or indicators were planned or agreed upon that contribute to gender equality and women's empowerment, including specific initiatives and indicators to address gender issues.

(9) Other Important Issues: The Project is expected to use Japanese technology such as corrosion-resistant trash racks, fiber-reinforced protective coating, and a pipeline inventory mapping system.

4. Targeted Outcomes

(1) Quantitative Effects

1) Outcomes (Operation and Effect Indicators)

Indicator	Baseline (Actual value in 2023)	Target (2034) [Two years after project completion]
Maximum flood depth in the project target area (cm) *1	80	30
Maximum flood duration in the project target area (hours) *2	96 *3	24
Drainage volume (m ³ /year) *4	N/A	23,000,000

*1 In hydraulic analysis simulation results for rainfall events with a 5-year return period, the maximum flood depth arising on roads, excluding depressions, wetlands, ponds, etc.

*2 In hydraulic analysis simulation results for rainfall events with a 5-year return period, the maximum duration of continuous flooding based on the current ground elevation.

*3 Based on findings from interviews with the Department of Public Works and Transport (DPWT) in Cambodia.

*4 The average runoff from the relevant drainage area under the Project calculated based on annual precipitation for 2012–2021.

(2) Qualitative effects: Reduction in economic losses caused by disruption of transport networks, stagnation of logistics, and suspension of commercial activities in the target area, as well as improvement in sanitary conditions.

(3) Internal Rate of Return

Based on the assumptions listed below, the economic internal rate of return (EIRR) for the Project is 12.9%. The internal financial rate of return (FIRR) cannot be calculated as there is no revenue.

[EIRR]

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

Benefit: Amount equivalent to losses due to suspension of economic activities

Project Life: 40 years

5. External Factors and Risk Control

(1) Preconditions: As the Project requires the completion of land acquisition and resident relocations, the costs of which will be borne by the General Department of Resettlement, Ministry of Economy and Finance and the PPCA, progress must be monitored.

(2) External Factors: None in particular

6. Lessons Learned from Past Projects

The ex-post evaluation of the “The Project for Flood Protection and Drainage Improvement in Phnom Penh Capital City (Phase III)” (evaluation year: 2018) in the Kingdom of Cambodia pointed out that the project outcomes were adversely affected by insufficient cleaning activities based on proper planning and the dumping of waste into drainage facilities by residents. In response, the Grant Aid project “The Project for Flood Protection and Drainage Improvement in Phnom Penh Capital City (Phase IV)” provided support to strengthen the capacity to develop cleaning plans and a registry for drainage facilities through soft components, and measures were taken to develop the capabilities necessary to implement systematic operation and maintenance. Based on the lessons described above, it has been confirmed that, under the Project, the organization and the operation and maintenance budget necessary for the formulation and implementation of a proper cleaning plan by the executing agency has been secured.

7. Evaluation Results

The Project aligns with Cambodia’s development challenges and policies as well as Japan’s and JICA’s cooperation policies and analyses. By developing and rehabilitating drainage facilities, the Project will help to improve the quality of life and promote industrial development in Phnom Penh City. It is expected to contribute to SDGs Goal 11 (make cities and human settlements inclusive, safe, resilient and sustainable) and Goal 13 (take urgent action to combat climate change and its impacts), and it is therefore necessary to support the implementation of the Project.

8. Plan for Future Evaluation

(1) Indicators to Be Used

As indicated in Section 4.

(2) Future Evaluation Schedule

Two years after completion of the Project: ex-post evaluation

END

Attachment: Project for Flood Protection and Drainage Improvement in Phnom Penh Capital City Maps

Project for Flood Protection and Drainage Improvement in Phnom Penh Capital City Maps

