

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

1. Name of the Project

- (1) Country: Kingdom of Cambodia (Cambodia)
 - (2) Project Site/Target Area: Siem Reap City
 - (3) Project: Siem Reap Water Supply Expansion Project (III)
- L/A signing date: June 22, 2023

2. Background and Necessity of the Project

- (1) Current State and Issues of Water Supply Sector Development in Cambodia and the Positioning of the Project

Water supply systems and other infrastructure in the Kingdom of Cambodia (hereinafter referred to as “Cambodia”) suffered extensive damage during the civil war that continued through to the early 1990s, and this has severely restricted access to safe water. Although Japan and other donors have worked hard to restore water supply services since the end of the war, these efforts have been concentrated in the capital Phnom Penh and the water supply rate in regional cities and towns remains low.

In 2011, Siem Reap was the largest tourism city in Cambodia with a recorded population of 221,000. The city was anticipating a rapid increase in demand for water due to the influx of tourists to the nearby Angkor Wat heritage site, which was attracting more than 2.8 million visitors per year. On the other hand, Siem Reap had one of the lowest water supply connection rates among major cities in Cambodia, with critical water shortages causing sanitary issues. Due to this background, the ODA Loan Agreement for the Siem Reap Water Supply Expansion Project (hereinafter referred to as “the Project”) was signed in March 2012 for its Phase I, and in October 2021 for Phase II (total project cost: 15,552 million yen; Japanese ODA loan amount: 13,497 million yen).

While the population of Siem Reap reached 307,000 (2022) and annual tourism numbers doubled over the previous decade (2.27 million in 2009 to 5.84 million in 2019), the impact of the global COVID-19 pandemic led to a sharp drop to 890,000 in 2020, and 380,000 in 2021. Since then, there has been a trend for recovery in the number of tourists, reaching 2.69 million in 2022, and a continuous recovery is expected hereafter. In addition, the Cambodian government has set a target in its "Tourism Development Master Plan Siem Reap" to achieve 10

million tourists by 2030, making the water supply expansion ever more urgent in order to meet further increasing water demand. Meanwhile, the Government of Cambodia has identified improving access to safe and secure water supplies as a priority development goal in the Rectangular Strategy Phase IV and the National Strategic Development Plan 2019–2023, with the goal of 100% of the urban population having access to safe water by 2025.

The Project is currently in progress, and the Phase II loan (6.336 billion yen, October 2021) was scheduled to cover the increase in project costs attributable primarily to substantial fluctuations in exchange rates and route changes required for the extensive roadworks in Siem Reap for treated water transmission mains that had already been installed. However, since the total project cost increased due to the significant depreciation of the yen from the time of the review (April 2021) to April 2023, the Government of Cambodia requested an additional loan (hereinafter referred to as "the Loan") from the Government of Japan.

(2) Japan and JICA's Cooperation Policy, etc. in the Water Supply Sector and the Positioning of the Project

The JICA Country Analysis Paper for Cambodia (March 2014) identifies water supply infrastructure as a development priority, while the Country Assistance Policy for Cambodia (July 2017) likewise identifies improved living standards as a priority area, with a particular focus on support for urban infrastructure development such as water supplies, sewerage and wastewater, power supplies (expanding coverage areas) and urban transportation (railways, bus and vehicle registration). The Project aims to align with these objectives, and it is also consistent with the "Kumamoto Initiative for Water" of the Japanese government, presented by Prime Minister Kishida at the 4th Asia-Pacific Water Summit in April 2022.

Japan has so far prepared a water supply master plan for the city through "The Project for Improvement of Water Supply System in Siem Reap Town Development Study" (2006) and constructed a water treatment plant with a capacity of 9,000m³/day through the "The Project for Improvement of Water Supply System in Siem Reap Town" (2006). Also, through technical cooperation in "The Project on Capacity Building for Water Supply System in Cambodia (Phase II; 2007-2012), Japan provided capacity-building in the operation and maintenance of water supply facilities to a number of waterworks in regional cities, including Siem Reap Water Supply Authority (hereinafter referred to as "SRWSA"), which reduced the non-revenue water rate in SRWSA from 19% to

10%. This was followed by “The Project on Capacity-Building for Urban Water Supply System in Cambodia” (Phase III; 2012–2018), which shifted the focus toward management issues such as financial management at 8 local publicly managed waterworks including SRWSA.

(3) Other Donors’ Activity

The Asian Development Bank funded assistance for extension of the water distribution mains in Siem Reap between 2018 and 2020, and the French Development Agency supported expansion of a water treatment plant (capacity 15,000 m³/day) between 2017 and 2019.

3. Project Description

(1) Project Description

① Project Objective: To ensure safe and stable water supply services by expanding the water supply system, thereby contributing to improve the living environment in the city of Siem Reap, where water shortages have reached critical levels due to a combination of rapid urbanization and tourism growth, and to promote the tourism industry in the region.

② Project Components

i) Water intake facilities, raw water transmission mains (10 km approx.), treated

water transmission mains (29 km approx.) (International competitive bidding: procured in September 2019), power distribution cables (approx. 10 km)

ii) Water treatment plant (60,000 m³/day) (International competitive bidding: procured in November 2019)

iii) distribution mains (260 km approx.) (International competitive bidding: procured in December 2018)

iii) Consulting services (detailed design, bidding assistance, supervision of works, human resource development/organizational strengthening, etc.) (Shortlist method: procured in January 2016)

③ Beneficiaries of the Project (Target Groups)

- Citizens and private companies supplied with water from the new water treatment plants
- Executing agency stakeholders who are the target of human resource development and organizational capacity-building

(2) Estimated Project Cost

18,809 million yen (ODA loan amount: 2,081 million yen)

(3) Schedule (Period for Cooperation)

March 2012-December 2024 (153 months)

Start of the facility operation (May 2023) is considered as the completion of the Project.

(4) Project Implementation Structure

- 1) Borrower: The Royal Government of Cambodia
- 2) Guarantor: None
- 3) Executing Agency: Siem Reap Water Supply Authority (SRWSA)
- 4) Operations and Maintenance Structure: Siem Reap Water Supply Authority (SRWSA)

(5) Collaboration and Sharing of Roles with Other Donors

1) Japan's Activity

Japan has so far prepared a water supply master plan for the city through "The Project for Improvement of Water Supply System in Siem Reap Town Development Study" (2006) and constructed a water treatment plant with a capacity of 9,000 m³/day through grant aid in "The Project for Improvement of Water Supply System in Siem Reap Town" (2006). Also, through technical cooperation in "The Project on Capacity Building for Water Supply System in Cambodia" (Phase II; 2007-2012), Japan provided capacity-building in the operation and maintenance of water supply facilities to a number of waterworks in regional cities, including Siem Reap Water Supply Authority (hereinafter referred to as "SRWSA"), which reduced the non-revenue water rate in SRWSA from 19% to 10%. This was followed by "The Project on Capacity Building for Urban Water Supply System in Cambodia" (Phase III; 2012–2018), which shifted the focus toward management issues such as financial management at 8 local publicly managed waterworks including SRWSA.

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(6) Environmental and Social Considerations

1) Environmental and Social Considerations

- ① Category: B
- ② Reason for the Categorization: An analysis of the characteristics of the

sector, the project and the region in line with the JICA Guidelines for Environmental and Social Considerations (April 2010) found no significant negative environmental impacts from the Project.

- ③ Environmental Permits: The Initial Environmental Impact Assessment (IEIA) for the Project was approved by the Ministry of Environment of Cambodia in July 2012. The IEIA for changes to the intake facility and water treatment plant construction sites were approved by the Ministry in August 2019.
- ④ Anti-Pollution Measures: Machinery and equipment will be subject to regular maintenance during construction. No construction work will be performed at night. Appropriate wastewater and effluent treatment will be provided. The executing agency has maintained pollution control measures at the existing water treatment facility through developing manuals and instructions on chlorine, water quality and sludge management. After commencing the service, the Project will adopt a similar approach to minimizing environmental impacts particularly with respect to air and water quality and construction noise and vibration.
- ⑤ Natural Environment: Some of the raw transmission mains pass through or near to protected areas, but domestic law permits development in these areas. The necessary procedures and processes from Tonle Sap Basin Authority have been followed. The SRWSA is committed to minimizing disruption to the natural environment caused by construction work, and to restoring vegetation and other natural assets after completion. It is therefore envisaged that negative impacts on the natural environment will be minimal.
- ⑥ Social Environment: The Project acquired approximately 3 ha land. The relevant permits were granted in line with the country's domestic procedures and the JICA guidelines, and land acquisition was completed in March 2017. No involuntary resettlement was required.
- ⑦ Other/Monitoring: During construction, contractors will be required to monitor water quality, noise and vibration and ecosystems, under the supervision of the executing agency. After commencing the service, the executing agency will monitor water quality, waste, and ecosystems.

(7) Cross-Sectoral Issues

Contractors of the Project and the SRWSA have implemented preventative measures for infectious diseases such as HIV/AIDS, as well as preventative measures for the spread of COVID-19 in accordance with the directions of the

Government of Cambodia. In addition, at the time of the last review, it was agreed that information will be disseminated to residents in areas where the

Project work is carried out, using a methodology that takes into account the needs of people with disabilities, and every effort will be made to provide employment opportunities to people with disabilities when hiring new workers, and consideration will also be given to the needs of workers with disabilities, such as information guarantees and safety guarantees.

(8) Gender Category: [N/A] ■GI (Gender Informed)

Reason for Categorization: After discussing gender-related initiatives with the destination government during the review, there was failure to plan initiatives that would contribute to gender mainstreaming, including specific metrics.

<Contents of Activity /Reason of Categorization>

(9) Other Important Issues

None in particular

4. Targeted Outcomes

(1) Quantitative Effects

1) Outcomes (Operation and Effect Indicators)

Indicator *	Baseline (Actual baseline in 2011)	Projected Target (2026 = three years after completion) **
No. of households connected to water supply	4,867	30,516
Total served population	24,876	183,096
Turbidity (NTU)	N/A	Less than 5***
Water treatment plant operating rate (%)	N/A	34****

* The indicators for households connected to water supply, total served population are for the total SRWSA supply area including trunk mains, water treatment plants and other elements outside the remit of the Project. Turbidity and water treatment plant operating indicators apply solely to the water treatment plant constructed under the Project.

** The reason why the target is set at three years after the completion of the Project is attributed to the fact that the demand for water has decreased due to the sharp drop in the number of tourists as a result of COVID-19, as well as the fact that the Government of Cambodia is planning to expand the water

distribution network in 2023 and 2024 followed by the connection of water supply to each of the houses and facilities; thus it is desirable to measure the effects of the Project in 2026 after the completion of the Project, when the effects of the Project will be realized.

*** Based on the domestic water quality standards in Cambodia.

**** The water treatment plant operation rate has been set lower than at the time of the Phase II loan because of a decline in water demand due to a sharp drop in the number of tourists as a result of COVID-19.

(2) Qualitative Effects

Qualitative effects include: improving the living environment of the people of Siem Reap; helping to conserve the Angkor Wat ruins by using surface water rather than extracting groundwater from beneath the ruins; providing a more stable investment environment to stimulate local industries such as tourism; and helping to control infectious disease through improved access to safe, clean water.

(3) Internal Rate of Return

Based on the following prerequisites, the economic internal rate of return (EIRR) for the Project has been calculated at 20.2% and the financial internal rate of return (FIRR) at -0.26%.

EIRR

Cost: Project costs associated with construction, operation, and maintenance (Excluding taxes)

Benefit: Savings from reduced water purchasing and health care expenses, increased tourism related revenue

Project Life: 40 years

FIRR

Cost: Project costs associated with construction, operation, and maintenance, and material and equipment replacement / updates

Benefit: Revenue from fees and charges

Project Life: 40 years

5. Prerequisites / External Conditions

(1) Prerequisites: None

(2) External Conditions: None

6. Lessons Learned from Past Projects

Ex-post evaluations of past water supply projects suggest that in some cases,

a lack of technical capacity at regional waterworks may have prevented the full output from being realized. Thus, capacity building at executing agencies is vital to ensure that projects can deliver sustained and ongoing output. The Project is leveraging these lessons learned to help the executing agencies improve their technical capacity through consulting services and technical cooperation projects.

7. Evaluation Results

The Project aligns with the assistance policies and analysis results of Japan and JICA, as well as the development issues and policies of Cambodia. The provision of safe and reliable water supplies to the city of Siem Reap will improve living standards in the city and help to promote tourism in the region. The Project is also consistent with the objectives of SDG 3 (Ensure healthy lives and promote well-being for all at all ages) and SDG 6 (Ensure availability and sustainable management of water and sanitation for all). The Project is therefore considered to have a high level of need that warrants support.

8. Plan for Future Evaluation

(1) Indicators to be Used

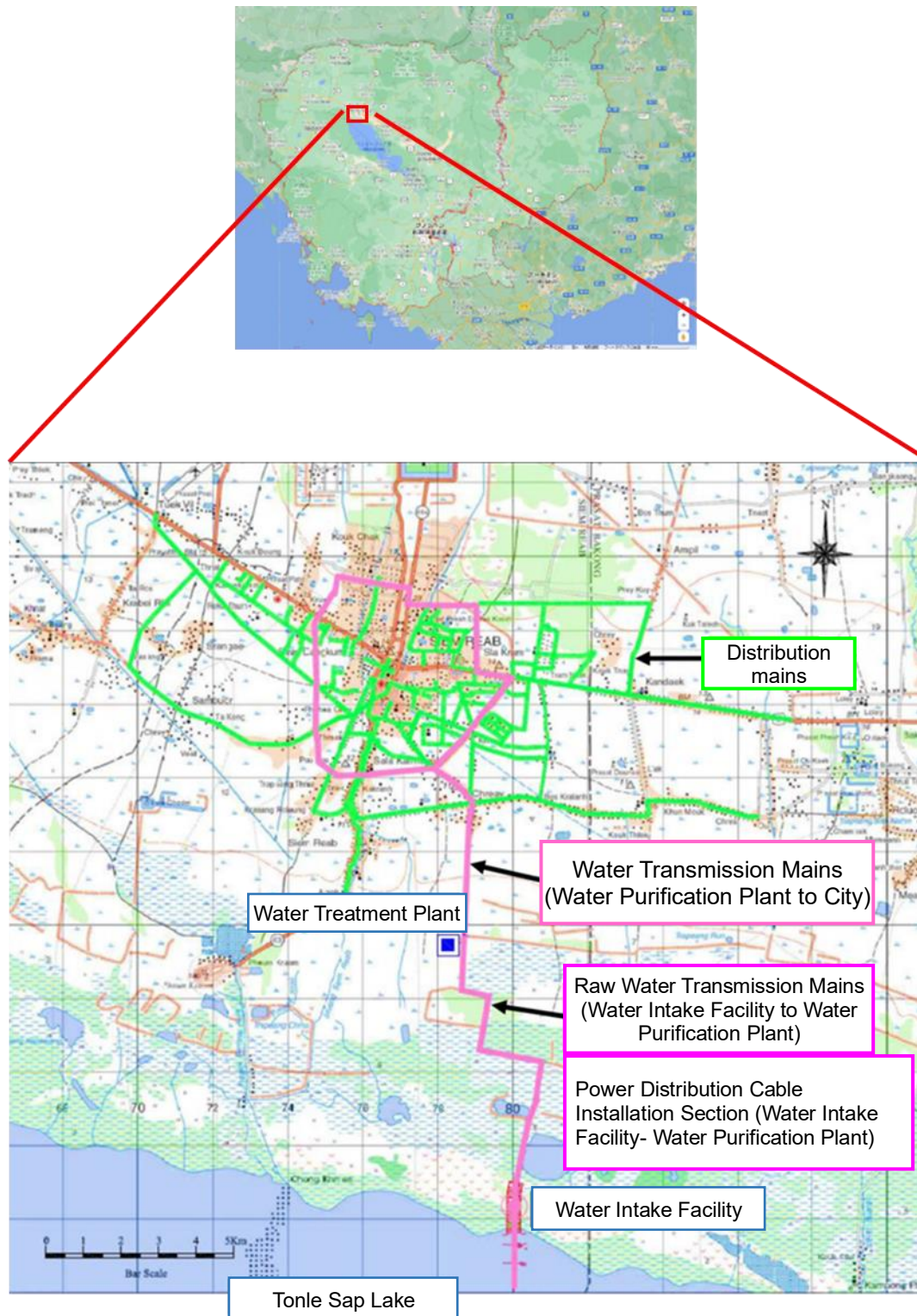
As indicated in 4 above.

(2) Future Evaluation Schedule

Ex-post-evaluation to be conducted three years after project completion.

END

Annex: Siem Reap Water Supply Expansion Project (Phase III) Map



Source: Google Maps / Material created by “Siem Reap Water Supply Expansion Project” Implementation and Supervision Consultant