

Ex-Ante Evaluation

South Asia Division 1, South Asia Department

Japan International Cooperation Agency

1. Name of the Project

- (1) Country: India
- (2) Project Title : Project for the Improvement of Urban Water Supply System in Uttarakhand
- (3) Project Site/ Target Area: State of Uttarakhand (Total Population: about 10 million (2011))

Loan Agreement: February 20, 2024

2. Background and Necessity of the Project

(1) Current State and Issues of the Water Sector and Priority in India

India is expected to have the world's largest population in 2023 and will continue to experience higher demand for water due to continued population growth (population growth rate of 0.8% as of 2021 (World Bank, 2023)) and high economic growth (GDP growth rate of 8.7% as of 2021 (World Bank, 2023)). In addition to developing water sources, there is a need to increase water supply and develop efficient water supply systems by rehabilitating aging existing facilities and strengthening operations and maintenance capacity, including reducing the non-revenue water rate (38% as of 2020 (Industrial Automation, 2020)). In light of this situation, the Government of India has been promoting the development of waterworks with the goal of providing piped water to all households by 2024. However, as of November 2023, only about 71% of all households in India are connected to the water supply system (Ministry of Jal Shakti, 2023), so the government needs to accelerate its efforts.

Located in northern India and bordering China and Nepal, the state of Uttarakhand has a population of about 10.08 million (Census, 2011) and an area of about 53,483 km², of which about 86% (46,035 km²) is steep mountainous terrain that extends from the Himalayas (Government of Uttarakhand, 2017). The state is the source of major rivers, including the Ganges, which originates from melting snow in the Himalayas and plays an important role as a water reservoir for the states located downstream. In addition, the urban population has continued to grow rapidly, increasing by about 42% in the 10 years from 2001 to 2011, well above the 32% average for urban areas across India over the same period (Government of Uttarakhand, 2019). In many areas around the Himalayas, including this state, rainfall is concentrated during the monsoon

season while other seasons are dry, making it difficult to secure sufficient water for agriculture and drinking water from surface water throughout the year. There are 13 districts and 102 urban towns in the state, and in 50 urban towns, more than 50% of all households are still not connected to the water supply system. Particularly in mountainous and remote rural areas, the number of households without access to sufficient drinking water throughout the year is 18.4%, higher than in urban areas of the state (3.0%) and the Indian average (9.1% in urban areas and 12.4% in rural areas), indicating that securing a stable source of water is an issue (Government of India, 2023). In addition, the effects of climate change are becoming more severe, as some districts in the state experienced droughts in 2016 and 2021 due to depletion of groundwater and lack of rainfall. Some areas in the state also suffer from delays in the development of water supply systems, forcing 60% of women and children to travel an average of 0.5 km and 10% to travel an average of 4 km to carry water daily (ENVIS, 2017). There are concerns about the physical burden of fetching and carrying water, as well as the loss of employment and schooling opportunities, making water supply in the state a critical issue not only from the perspective of stable access to water, but also from the perspective of gender mainstreaming.

Recognizing this situation, the Government of Uttarakhand has formulated the “Uttarakhand Vision 2030” and the “Improving Drinking Water Policy for Peri Urban Areas” and is promoting the development of water supply systems with a focus on providing safe and stable drinking water and efficient water resource management in the mountainous and remote areas of the state where development is lagging behind. The Project for the Improvement of Urban Water Supply System in Uttarakhand (hereinafter referred to as "the Project") is consistent with the state's policy to support the provision of stable water supply services to households through the development of an efficient water supply network in areas including mountainous and remote areas of the state.

(2) Japan's and JICA's Policy for Cooperation and Operations in the Water Sector (especially in relation to key foreign policies such as the Free and Open Indo-Pacific Partnership (FOIP))

Country Assistance Policy for India (March 2016), formulated by the Government of Japan, stipulates “supporting sustainable and inclusive growth” as one of the priority areas, and positions cooperation in water supply and sewage as important areas to tackle environment and climate change issues. The JICA's Country Analysis Paper on India (March 2018) also highlights

“improvement of basic social services” in “Supporting Sustainable and Inclusive Growth”, which is one of the priority areas, stating that JICA will support India in achieving sustainable economic growth and ensuring that the benefits of this growth will be shared equally by society.

In addition, the Project is consistent with one of the Pillars of the “Free and Open Indo-Pacific” initiatives, “Addressing Challenges in an Indo-Pacific Way” in that the Project will stable water supply and climate change responses through water resource management.

The JICA Global Agenda also identifies “Sustainable Water Resources Management and Water Supply” as an important issue. Its cooperation policy and analysis to support the growth of the country by increase the revenue from water utilities through service improvement such as expansion and maintenance of water supply facilities, promoting stable operations, and expanding the potential for further investment are in line with this Project.

Furthermore, the Kumamoto Water Initiative, announced by Prime Minister Kishida at the 4th Asia-Pacific Water Summit in April 2022, calls for approximately 500 billion yen in assistance over 5 years to promote the development of high-quality water supply and accelerate water-related initiatives in the Asia-Pacific region and the rest of the world. This Project is in line with such initiatives as well.

(3) Other Donors’ Activities

The World Bank has been supporting Uttarakhand Water Supply Program for Peri Urban Areas (USD 150 million) since 2018. The ADB has been supporting Uttarakhand Integrated and Resilient Urban Development Project (USD 156 million) since 2021, which includes support to improve access to affordable and safe drinking water. KfW banking group has been supporting Environmentally Friendly Urban Development Program in Ganga Basin (USD 218 million) to prevent untreated sewage from entering the Ganges River and improve the river's water quality.

3. Project Description

(1) Project Description

① Project Objective

The Project aims to provide stable water supply services to areas in the northern Indian state of Uttarakhand that do not have access to sufficient drinking water, including mountainous and remote areas, and thereby contribute to improving the living environment of the people in these areas and their adaptation

to climate change.

② Project Components

The Project aims to achieve the above-mentioned project objectives by implementing multiple projects (hereinafter referred to as "sub-projects") in the target area to develop water supply facilities of one of the three types: pumping distribution system, gravity flow distribution system, and tube well intake system, up to ODA loan amount. The executing agencies prepared the Detailed Project Reports (hereinafter referred to as "DPR") for 38 urban towns as candidate subprojects for the Project, of which 18 urban towns were selected as high-priority. At the stage of implementation, sub-projects will be determined up to the loan amount of the Project. The main components included in sub-projects are as follows, and the components covered by ODA loans are (a) through (c) and (e). Although included in (a) through (c), the cost for household connections (including meter reading installation) and operation and maintenance costs (for 2 years) will be borne by the India side.

<Main components of the Project>

- a) Development of pumping water distribution system (intake facilities, rising mains, water treatment plants, intermediate pumping stations, transmission pipelines, distribution reservoir, distribution pipelines, IoT system*, power receiving equipment, household connections (including meter installation), etc.) and its operation and maintenance (2 years).
- b) Development of gravity flow water distribution (intake facilities, rising mains, water treatment plants, transmission pipelines, distribution reservoir, distribution pipelines, IoT system*, power receiving equipment, household connections (including meter installation), etc.) and its operation and maintenance (for 2 years)
- c) Development of water intake system from wells (intake facilities, overhead tanks, transmission pipelines, distribution pipelines, IoT system*, power receiving equipment, household connections (including meter installation), etc.) and its operation and maintenance (for 2 years)
- d) Consulting Services (1) (baseline surveys (e.g., data collection for sub-project selection))
- e) Consulting Services (2) (review of the results of baseline survey, basic design, bidding documents preparation and tender assistance, construction supervision and monitoring, construction safety management, assistance in procedures and monitoring related to

Environmental and Social Considerations, strengthening capacity and organizational structure of the executing agencies and operation and maintenance organizations, awareness-raising activities (promotion of household connections), support for activities related to gender mainstreaming (results monitoring, awareness-raising activities, etc.), etc.)

*A cloud-based system that monitors and manages water supply facilities centrally. Automatic meter reading are sought be introduced in some areas.

③ Project Beneficiaries (Target Groups)

Customers who will use the water supply facilities to be developed under the Project, and staff of the executing agencies who are the target of the human resource development and organizational capacity development activities.

(2) Estimated Project Cost

24,729 million yen (Japanese ODA loan: 16,211 million yen)

(3) Schedule (Cooperation Period)

February/2024 - May/2033 (112 months). The commencement of operation of the facilities for all selected sub-projects (April 2031) is considered as the completion of the Project.

(4) Project Implementation Structure

1) Borrower: President of India

2) Guarantor: N/A

3) Executing Agency: Department of Drinking Water and Sanitation, Uttarakhand Peyjal Sansadhan Vikas Evam Nirman Nigam) (hereinafter referred to as "UKPJN")

4) Operation and maintenance system:

Upon completion of the Project, ownership and authority for operation and maintenance of all facilities will be transferred from UKPJN to Uttarakhand Jal Sansthan (hereinafter referred to as "UJS"). However, in order to allow time for UJS to procure contractors responsible for operation and maintenance (hereinafter referred to as "the O&M contractors"), operation and maintenance of each facility will continue to be implemented by the construction contractors for a period of two years. During this period, UJS will procure the O&M contractors, and upon expiration of the two-year period, the O&M contractors will begin operation and maintenance of the facilities. The outsourced O&M costs are usually covered by grant from the Government of Uttarakhand, and it has been confirmed with Finance Department of the state government that the same will be applied for the Project and that the budget will be securely allocated.

(5) Collaboration and Sharing of Roles with Other Donors

1) Japan's Activities: None

2) Other Donor's Activities: None

(6) Environmental and Social Considerations

① Category : FI

② Reason for Categorization

The Project cannot identify sub-projects before JICA's loan approval under the "JICA Guidelines for Environmental and Social Considerations" (issued in January 2022), and such subprojects are expected to have environmental impacts.

③ Other/Monitoring

Under the Project, the executing agencies, with the assistance of Project Management Consultant hired under JICA ODA loan project, will classify sub-projects into categories based on India's domestic legal system and JICA Guidelines for Environmental and Social Considerations, and the necessary measures will be taken according to the result of categorization. The Project will not include any sub-projects which is Category A.

(7) Cross-Sectoral Issues

① Climate change related projects

As the Project includes sub-projects to change the water resource from spring water to surface water, it is expected to mitigate an effect of climate change, and will reduce the risk of adverse climate change impacts by providing a relatively stable water resource that will not be affected by rainfall variability. Therefore, the Project contribute to climate change countermeasures (adaptation).

② Consideration for persons with disabilities

In consideration of people with disabilities, the Project will install universally designed toilets and rest areas at construction sites and promote employment of people with disabilities.

(8) Gender Category:

【Gender Project】 ■GI (S) (Gender Informed (Significant))

< Reason for Categorization > Awareness-raising activities to change stereotypical gender roles on gender issues such as the burden of carrying water, which is mainly done by women, will be conducted with the target community residents and the results and progress will be monitored. For these reasons, the Project is classified as a “gender activity integration project”.

(8) Other Important Issues: None

4. Target Outcomes

(1) Quantitative Effects

2) Outcomes (Operation and Effect Indicators)

Indicator	Baseline	Target (2033) 【2 years after project completion】
Population with water supply (thousand)		(Note)
Daily water supply (hours)		
Water supply volume (m ³ /day)		
Percentage of urban towns within the Project target area that have achieved 135 liters per person per day (LPCD) (%) (

(Note) The baseline and target values will be determined based on the results of the baseline survey to be conducted after the commencement of the Project through discussions between the executing agencies and JICA with the

assistance of consultant/s hired under the ODA loan.

(2) Qualitative Effects

Stable water supply, improvement of the health condition and living environment of the population, promotion of women's social participation, adaptation to climate change, etc.

(3) Internal Rates of Return

Based on the assumptions listed below, the economic internal rate of return (EIRR) for the Project is 33.2%. The Project is not intended to generate revenue from water service charges, and the financial internal rate of return (FIRR) is not calculated.

【EIRR】

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

Benefit: Effects of water tariffs based on willingness to pay, reducing costs from use of non-piped resources, reducing water collection time, reducing earning loss due to waterborne diseases, and reducing domestic water treatment cost.

Project Life: 30 years

5. External Factors and Risk Control

(1) Preconditions: None

(2) External Factors: None

6. Lessons Learned from Past Projects

From the ex-post evaluations of the ODA loans for India, such as the West Bengal Piped Water Supply Project (evaluated in FY2017), the Guwahati Sewerage Project (evaluated in FY2020), and the Kerala Water Supply Project (I) (II) (III) (evaluated in FY2020), lessons learned are that in order to prevent project delays due to obtaining permits and scoping changes, etc., it is necessary not to rely solely on the DPR and information submitted by the executing agencies, but to collect detailed data through JICA's own survey and other means separately, and to fully confirm the appropriateness, feasibility, etc. of the Project at the appraisal stage. In the Project, detailed data was collected through the Data Collection Survey for Urban Water Supply and Sewerage System in Uttarakhand, and feasibility was examined based on the appropriateness of the project's water resource management plan, land acquisition status, etc. In addition, sub-projects will be selected through baseline surveys to fully confirm the sustainability of the water source, operation and management system of the entity after the development of the facilities, and the safety during project implementation.

7. Evaluation Results

The Project is in line with the development agenda and policies of the Government of India and the development cooperation policies and analysis of Japan and JICA, and will contribute to the provision of stable water supply services, improvement of the living environment of the people in the region and adaptation to climate change through the development of water supply facilities. It is also expected to contribute to SDGs Goal 3 “Ensure healthy lives and promote well-being for all at all ages”, Goal 6 “Ensure availability and sustainable management of water and sanitation for all”, and Goal 13 “Take urgent action to combat climate change and its impacts”, making the implementation of this Project highly significant.

8. Plan for Future Evaluation

(1) Indicators to be Uses.

As indicated in Section 4.

(2) Future Evaluation Schedule

Ex-post evaluation: 2 years after project completion

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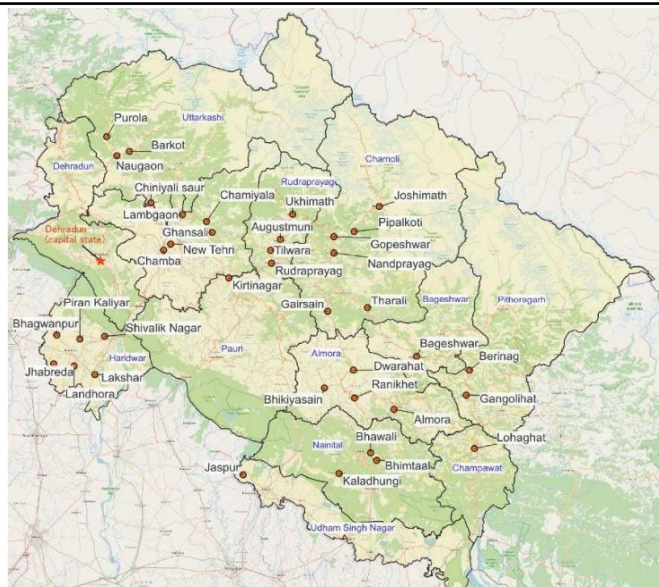
Appendix: Map of Project for the Improvement of Urban Water Supply System in Uttarakhand

Map: Project for the Improvement of Urban Water Supply System in Uttarakhand



(Source : JICA survey team)

Candidate urban towns for subprojects (red circles)



(Source : JICA survey team)