

Kathmandu Valley Water Supply Management Board
Kathmandu Valley Water Security Improvement Project (KV WaSIP)
Grant Facility for Project Preparation (GFPP)
Terms of Reference for Recruitment of a
Senior Dam Specialist

Position	Senior Dam Specialist
Duty Station	Kathmandu, Nepal with visit to Project site
Contract Duration	17 Months
Full Time/Intermittent	Intermittent (144 days)
Expected Start Date	October 2026

1. Context

Kathmandu Valley anchors Nepal's aspiration for double-digit, jobs-led, inclusive growth. Kathmandu Valley (KV) is Nepal's capital region and home to more than 3 million people. KV is among the fastest growing metropolitans in South Asia, expected to reach 4.5 million by 2041. KV houses a quarter of Nepal's formal jobs, and nearly one in five businesses, and contributes over a third of national GDP (and higher if excluding remittances). KV is already driving Nepal's job-led growth, providing over a quarter of nonfarm employment in promising sectors such as ICT and tourism (KV houses 61% of ICT jobs, and is the gateway to Nepal). But systemic challenges in KV's urban infrastructure and institutions will limit future growth if unaddressed, including heavy traffic congestion and inadequate road infrastructure; limited urban planning and resilient public spaces; a lack of reliable waste management, with almost no wastewater treatment; and a severe water supply shortage.

KV's water supply faces the double challenge of insufficient bulk water and low resilience. Current water supply to the core city is estimated to be about a third of expected demand (average water supply remains around 40 liters per capita per day (lpcd), significantly below the planning standard of approximately 130 lpcd required to ensure adequate and reliable urban service levels). As a result, most households receive water for only about 2 hours a few times a week. The majority of bulk water comes from the Melamchi system, which delivers about 170 million liters per day for part of the year, with plans to increase this supply over the next decade to 510 million liters per day. While reliable estimates of demand have not been conducted, current demand is likely around 490 million liters per day and is expected to increase as the capital's population and economic development grow. Reliance on a single source of bulk water increases the overall vulnerability of KV's water system to disasters, and there is a growing need to increase resilience through additional bulk water options in the event that the Melamchi catchment or bulk water system is affected, as was the case in the 2021 cascade disaster.

The cost of an inadequate water supply is high. Households and businesses supplement municipal water supply through groundwater, public taps, rainwater, or tankers, where possible. People pay up to 4 times the price of public piped water to buy water from vendors. Groundwater has been an overexploited lifeline to the valley, but it faces equity and environmental issues: deep tubewells that hotels, housing colonies, and industries can afford have begun to deplete water tables, drying out shallow tubewells that households rely on and causing land subsidence in parts of the city. The hidden cost of unsafe water is also high. Waterborne diseases are a significant public health concern in KV, with over 60% of households consuming sewage-contaminated water containing E. coli. Common illnesses include typhoid, diarrhea, cholera, dysentery, and jaundice. Risk peaks during the monsoon season (March–September), and contaminated groundwater and jar or tanker water are major sources of infection.

2. Project Description

The proposed KV WaSIP aims to enhance the availability, reliability, and climate resilience of potable bulk water supply for the Kathmandu Valley through the development of a regulated storage-based source on



the Sisneri River in Makawanpur District. The Project responds to the limitation of available river flows, which are insufficient to sustain a run-of-river supply system during the dry season. Earlier studies under the Bagmati River Basin Integrated Master Plan, together with subsequent feasibility and preliminary design work, identified the Sisneri River as a technically viable and strategically important source for augmenting the Valley's bulk water supply.

Based on the latest feasibility assessments, the preferred scheme comprises a storage dam located upstream of the Kogate–Sisneri confluence, with a preliminary crest length of approximately 162 meters and a height of approximately 65 meters. The reservoir is expected to provide an estimated gross storage capacity of approximately 17.77 million cubic meters, including a live storage volume of approximately 15.35 million cubic meters. Preliminary operating levels are defined between a minimum drawdown level of approximately 1,124 masl and a maximum pool level of approximately 1,157 masl. Subject to hydrological conditions, system optimization, and operating rules, the scheme is expected to supply up to approximately 140 MLD during the wet season and approximately 80 MLD during the dry season.

Reservoir regulation is central to the Project design, enabling the capture and regulation of monsoon flows to improve dry-season supply reliability and strengthen long-term water security. Reservoir operations will need to account for environmental flow requirements, sediment management, flood routing, reservoir filling procedures, spillway and outlet operating rules, and potential source augmentation through diversion from the Kogate River and, if required, the Kulekhani Reservoir system. The Project will also include reservoir operation and water balance models to assess system yield under different hydrological and climate scenarios and to establish safe, efficient, and sustainable operating parameters.

The proposed infrastructure includes the dam and reservoir, a dam-integrated raw water intake structure, possible source augmentation works linked to the Kogate River and Kulekhani Reservoir system, and associated ancillary infrastructure, including spillway and outlet works, access roads, power supply, construction camps and staging areas, and administrative and operational facilities. The wider bulk water supply system is expected to include transmission and pumping infrastructure connecting the scheme to downstream treatment and storage facilities, including conveyance arrangements linked to the Sainbu Reservoir system. The intake is proposed to be integrated into the dam structure and designed to accommodate the planned bulk water supply capacity.

Given that earlier investigations were based on limited field data and preliminary site characterization, further technical investigations and validation will be required before final design. These will confirm key hydrological, geological, geotechnical, hydraulic, sedimentation, dam safety, and climate resilience assumptions. The Project will therefore include feasibility confirmation and optimization of dam and reservoir alternatives, followed by detailed engineering design, cost estimates, implementation planning, operation and maintenance arrangements, dam safety documentation, environmental and social risk management inputs, and bidding documents to support construction and implementation.

3. Objectives of the Assignment

As a team member of the Project Management Unit (PMU), the overall objective of the assignment is to provide senior-level technical leadership, independent review, and quality assurance for the feasibility confirmation, detailed design, and implementation readiness of KV WaSIP, with a focus on ensuring that the proposed dam, reservoir, intake, source augmentation works, and associated bulk water supply infrastructure are technically sound, safe, climate-resilient, operable, constructible, and fit for long-term service.

4. Scope of Services

The Senior Dam Specialist shall support the Project in assessing the adequacy, coherence, and readiness of studies, field investigations, engineering options, design assumptions, technical interfaces, and draft deliverables prepared by the Consultant during both the feasibility update and detailed design stages, and shall help ensure that project outputs are technically sound, risk-informed, implementable, and consistent with applicable national requirements and international good practice for dam engineering.

Specific tasks and responsibilities include, but are not limited to, the following:

- Provide senior technical leadership and quality assurance within the PMU for the Sisneri bulk water supply scheme, including the dam, reservoir, intake, source augmentation works, transmission system, treatment interfaces, storage facilities, and downstream bulk distribution infrastructure, and support technical coherence across all major system components.
- Review¹ and advise on the adequacy, completeness, and consistency of relevant project studies, field investigations, designs, calculations, technical reports, drawings, specifications, cost estimates, schedules, and implementation documents prepared by the Consultant, and identify gaps, inconsistencies, sequencing issues, or additional work required to support feasibility confirmation, detailed design, procurement, and implementation readiness.
- Guide the technical review of dam siting, dam type selection, reservoir configuration, intake integration, source augmentation options, spillway and outlet arrangements, river diversion concepts, foundation treatment, construction materials, borrow areas, and the compatibility of the proposed scheme with site conditions, water demand objectives, dam safety requirements, and long-term operability.
- Review the adequacy of hydrological, hydraulic, geological, geotechnical, seismic, structural, sedimentation, climate risk, and climate resilience analyses, including assumptions, design criteria, return periods, design floods, seismic parameters, sediment yield, reservoir life, and sensitivity testing under future climate scenarios.
- Review the integration of the dam and reservoir with the broader bulk water supply system, including raw water abstraction, pumping, conveyance, treatment interfaces, intermediate and terminal storage, and downstream bulk distribution, to ensure consistency across the full supply chain from source to service delivery.
- Review technical aspects of the bulk distribution and system integration studies, including network data validation, hydraulic stress assessment, pressure and storage requirements, operational integration, control philosophy, and any redesign or strengthening measures required to ensure that Sisneri water can be safely, reliably, and efficiently transmitted and distributed through the downstream system.
- Review and advise on reservoir operation assumptions and system operating philosophy, including storage allocation, initial filling, flood routing, dry-season reliability, environmental flow releases, sediment management, operational interfaces with treatment and storage facilities, conjunctive use with other water sources, and the implications of operating rules for both dam safety and bulk water service delivery.
- Support the PMU in reviewing dam safety, operational reliability, and system resilience considerations, including spillway and outlet capacity, diversion flood handling, dam-break analysis, inundation mapping, emergency preparedness measures, flood protection requirements, instrumentation and monitoring concepts, reservoir surveillance, and operational risk mitigation measures required for safe and sustainable long-term performance.

¹ For the purposes of this TOR, “review” means the systematic examination of a document, design, deliverable, or process to assess its quality, completeness, accuracy, consistency, and compliance with applicable requirements, and to provide clear comments and recommendations for improvement, where needed.



- Support preparation and review of key dam safety documents, including the Dam Safety Plan, Construction Supervision and Quality Assurance Plan, Instrumentation Plan, Operation and Maintenance Plan, Emergency Preparedness Plan, reservoir filling plan, and related procedures required under applicable World Bank requirements, national regulations, and international good industry practice.
- Review the adequacy of studies and designs for associated infrastructure, including service reservoirs, access roads, bridges, slope stabilization works, flood protection measures, power supply interfaces, construction camps, staging areas, spoil disposal areas, and other ancillary facilities required for construction and operation of the Sisneri scheme.
- Provide technical guidance on implementation readiness, including construction sequencing, interface management, contract packaging, procurement strategy, technical specifications, quality control requirements, operability considerations, O&M arrangements, and the technical soundness of bidding and procurement documents.
- Support the PMU during procurement by reviewing technical sections of bidding documents, responding to technical clarifications, supporting bid evaluation from a technical perspective, and advising on contractor qualifications, construction methodology, risk allocation, and implementation capacity.
- Contribute to the review of financing and operational modality assessments from a technical perspective, including the consistency of proposed institutional arrangements, operational responsibilities, asset management arrangements, staffing requirements, O&M financing, and performance monitoring mechanisms with the technical requirements of the Sisneri scheme.
- Coordinate closely with specialists across dam engineering, hydrology, hydraulics, geology, geotechnical, seismic, structural, electromechanical, environmental, social, treatment, conveyance, storage, and distribution disciplines to ensure integrated technical review and timely resolution of cross-cutting issues.
- Liaise with the Consultant, PMU, World Bank, relevant government agencies, and, where applicable, independent dam safety reviewers or panels of experts, to ensure that technical comments, review findings, and agreed actions are properly tracked, addressed, and reflected in project outputs.
- Review technical interfaces with environmental and social risk management instruments, including land requirements, reservoir inundation, downstream impacts, environmental flows, construction impacts, spoil management, community safety, emergency preparedness, and occupational health and safety considerations.
- Support technical risk management by identifying key design, construction, operational, safety, climate, schedule, and cost risks; advising on mitigation measures; and helping maintain a clear technical risk register and action plan for the PMU.
- Provide structured review comments, practical recommendations, technical briefs, and knowledge transfer support to strengthen the quality and usability of project outputs, improve PMU decision-making, and build institutional capacity for implementation, operations, dam safety management, and long-term bulk water asset management.

5. Expected Outputs

The Senior Dam Specialist will be responsible for the following key deliverables:

- Inception Note outlining the review approach, technical priorities, coordination mechanisms, and quality assurance framework for dam and bulk water supply system review.
- technical review reports on feasibility studies, detailed designs, investigations, engineering analyses, drawings, specifications, cost estimates, schedules, and implementation documents.
- Independent assessment and recommendations on dam engineering, reservoir configuration, intake systems, spillways, outlet works, river diversion, foundation treatment, construction materials, and associated infrastructure.




- Technical review of dam safety, hydrological, hydraulic, geological, geotechnical, seismic, structural, sedimentation, climate resilience, and operational risk assessments, including recommendations for design improvements.
- Review and recommendations on reservoir operations, system integration, bulk water conveyance, treatment interfaces, storage facilities, and downstream distribution system integration.
- Review and inputs to dam safety documentation, including Dam Safety Plan, Construction Supervision and QA Plan, Instrumentation Plan, Reservoir Filling Plan, O&M Plan, and Emergency Preparedness Plan.
- Technical support during procurement and implementation, including review of bidding documents, technical specifications, bid evaluations, construction methodologies, contract packaging, and implementation readiness assessments.
- Consolidated technical review reports, risk registers, technical briefs, presentations, and final recommendations to support PMU decision-making, dam safety compliance, sustainable operations, and long-term asset management.

6. Qualifications and Experience Requirements

All applications will be evaluated against the assignment's required qualifications (Table 1).

Candidates who comply with the qualifications will be scored according to predefined criteria. A minimum of three candidates will be shortlisted and interviewed. The candidate with the highest score will be invited to negotiate a contract. Referees of the selected candidate may be contacted to verify prior experience, performance, and interpersonal skills.

The Senior Dam Specialist shall possess strong academic qualifications and demonstrated professional experience relevant to dam engineering, bulk water supply systems, and multidisciplinary technical review of major water infrastructure projects. The expert should have proven capability to provide strategic technical leadership, assess the adequacy of feasibility studies and detailed designs, review engineering assumptions and system interfaces, and advise on dam safety, implementation readiness, operational reliability, and long-term asset performance across the full bulk water supply chain.

Table 1. Qualifications and Relevant Experience

Education	• The expert shall hold at least a bachelor's degree in civil engineering, water resources engineering, hydraulic engineering, structural engineering, or a related discipline. • A master's degree in dam engineering, water resources, hydraulic structures, geotechnical engineering, structural engineering, or a closely related field is required, and a PhD will be considered an added advantage.
Work Experience	• At least 15 years of relevant professional experience in dam engineering, bulk water supply infrastructure, feasibility and detailed design review, and implementation support for major water resources or water supply projects. • Substantial experience in planning, design review, or technical supervision of large dams and associated infrastructure, including reservoirs, intakes, spillways, outlet works, and diversion arrangements. • Proven ability to review multidisciplinary engineering studies and technical outputs, with sound knowledge of dam safety principles,



	reservoir operation, flood handling, instrumentation, emergency preparedness, and risk-informed design and operational review.
Interpersonal Skills	Strong analytical, report writing, and communication skills, and shall be able to communicate clearly and effectively in spoken and written English.

7. Evaluation and Selection Method

The Senior Dam Specialist will be hired by the PMU using the Open Competitive Selection of Individual Consultants method following “**World Bank Procurement Regulations for Investment Project Financing Goods, Works, Non-Consulting and Consulting Services**” (July 2016) Seventh Edition 2025².

The attention of interested Consultants is drawn to Section III, paragraphs 3.14, 3.16, and 3.17 of the World Bank’s “Procurement Regulations”.

8. Duration of the Assignment

The Senior Dam Specialist is expected to provide support to the project team for an expected input of 144 person days during the 17 months grant implementation period on an intermittent basis. The consultant and the client shall plan the inputs of the specialist based on the project schedule and report deliverables of the Design Consultant to be selected.

9. Remuneration

A market-based salary package commensurate with the candidate's experience and qualifications will be offered.

10. Reporting

The Senior Dam Specialist will report directly to the Project Manager, PMU.

11. Location

- The consultant will be based at the PMU office and may be required to travel outside the valley as needed for project-related procurement activities.
- The Project shall provide following facilities to consultant during his tenure of service:
 - Office space
 - Email and internet access
 - Required office stationery and other materials
 - Photocopying/printing facilities

12. Application Process

Interested candidates shall submit a complete application package comprising:

- Up-to-date curriculum vitae (CV).
- Copies of academic and professional certificates.
- Contact details for at least three (03) professional references familiar with the candidate’s relevant work.

Applications shall be submitted electronically no later than 17.00 PM on 11th September 2026 to the following e-mail address: sisnerikvwsmb@gmail.com. Only complete applications received by the deadline will be considered.

² The World Bank Procurement Regulations can be accessed via this [link](#).

