UNITED REPUBLIC OF TANZANIA

MINISTRY OF AGRICULTURE

NATIONAL IRRIGATION COMMISSION

REQUEST FOR EXPRESSION OF INTEREST

(CONSULTING SERVICES – FIRMS SELECTION)

PROJECT NAME: TANZANIA INTERMODAL RAIL DEVELOPMENT PROJECT (TIRP-2)

PROJECT ID: P176682, IDA CREDIT NO: 75290

TENDER REFERENCE NO. : TZ-NIRC-519759-CS-QCBS

PROVISION OF CONSULTANCY SERVICES FOR INDEPENDENT DESIGN REVIEW AND CONSTRUCTION SUPERVISION OF KIDETE AND KIMAGAI DAMS AND ASSOCIATED FLOOD-CONTROL WORKS UNDER COMPONENT 2 OF THE SECOND TANZANIA INTERMODAL AND RAIL DEVELOPMENT PROJECT (TIRP-2)

1. This request for Expression of Interests follows the General Procurement Notice for this Project that appeared in United Nations Development Business (UNDB) Issue No. WB2651-05/13 posted on May 2013.
2. The Government of the United Republic of Tanzania has received a credit from the World Bank towards the cost of the Tanzania Intermodal Rail Development Project (TIRP), and intends to apply part of the proceeds for Consultancy Services.
3. The consulting services ("the Services") include the Conducting of Independent Design Review and Construction Supervision of Kidete and Kimagai Dams and Associated Flood-Control Works under Component 2 of the Second Tanzania Intermodal and Rail Development Project (TIRP-2) for the period of Thirty-Nine (39) Calendar Months. The detailed Terms of Reference (TOR) for the assignment can be found at the following website: www.nirc.go.tz
4. The National Irrigation Commission on behalf of Government of Tanzania, now invites eligible consulting firms ("Consultants") to indicate their interest in providing Services. Interested Consultants should provide information with supporting documents demonstrating that they have the required qualifications and relevant experience to perform the Services.
5. The shortlisting criteria are: (i) experience in similar assignments - successful preparation of at least 3 similar contracts (by size and complexity) in the last ten years - information to be provided should include name of assignment, name and full contact address of the client, contract value (in equivalent US dollars) and period (dates) of execution of assignments; , (ii) experience in similar conditions; and (iii) technical and managerial capability of the firm (Provide only the structure of the organization, general qualifications and number of key staff. Do not provide CV of the key staff. Experts will not be evaluated at the shortlisting stage. (iv) Financial Capability of the firm
6. 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 for IPF Borrowers" sIxth Edition, February 2025, setting forth the World Bank's policy on conflict of interest. In addition, please refer to the following specific information on conflict of interest related to this assignment: Consultants shall not be hired

for any assignment that would be in conflict with their prior or current obligations to other clients, or that may place them in a position of being unable to carry out the assignment in the best interests of the Borrower.

7. Consultants may associate with other firms to enhance their qualifications but should indicate clearly whether the association is in the form of a joint venture and/or a sub-consultancy. In the case of a joint venture, all the partners in the joint venture shall be jointly and severally liable for the entire contract, if selected. Therefore, each member of JV shall independently meet the requirements of the evaluation criteria. A Consultant will be selected in accordance with the procedures set out in the Quality and Cost Based Selection Method (QCBS) set out in the World Bank's "Procurement Regulations for IPF Borrowers" Sixth Edition, February 2025.
8. Further information can be obtained at the address below during office hours from 08:00 – 16:00 hours local time, Mondays to Fridays inclusive, except Public Holidays.
9. Expression of interest must be delivered in a written form to the address below (in person or by mail, or by e-mail) by January 7, 2026. The firms which will submit their REOIs via e-mail must get confirmation of the receipt of their documents from NIRC. In case the firm does not receive an acknowledgement from NIRC immediately after sending the documents via email please call Mr. Raphael Laizer (+255 656 112 107) or Email: raphael.laizer@nirc.go.tz for follow-up. NIRC is not responsible for any corrupted documents**.**

The Secretary,
NIRC Tender Board,
PMU Office, Kikuyu South,
P.O Box 146,
Dodoma.
TANZANIA.
DIRECTOR GENERAL
NATIONAL IRRIGATION COMMISION (NIRC)

UNITED REPUBLIC OF TANZANIA

MINISTRY OF AGRICULTURE

NATIONAL IRRIGATION COMMISSION

Terms of Reference for Independent Design Review and Construction Supervision of Kidete and Kimagai Dams and Associated Flood-Control Works under Component 2 of the Second Tanzania Intermodal and Rail Development Project (TIRP-2)

Project ID: P176682 | IDA Credit No: 75290

November, 2025

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1.0 BACKGROUND AND RATIONALE

The Government of the United Republic of Tanzania (URT), through the Tanzania Railways Corporation (TRC), has secured approximately US $200 million from the International Development Association (IDA) to implement the Second Intermodal and Rail Development Project (TIRP-2). The project is designed to strengthen railway infrastructure, enhance climate resilience, and improve logistics capacity along the central railway corridor (Dar es Salaam–Dodoma–Isaka).
TIRP-2 comprises four mutually reinforcing components:

- **Component 1**: Strengthening of railway infrastructure and support for design studies.
- **Component 2**: Strengthening climate resilience of the Kilosa–Gulwe–Igandu section.
- **Component 3**: Institutional safety and operational support.
- **Component 4**: Contingent Emergency Rapid Response Component (CERC).

Implementation responsibilities are shared between the National Irrigation Commission (NIRC) under Component 2 and TRC under Components 1, 3, and 4. The project's direct beneficiaries include TRC, NIRC, LATRA, and socio-economic sectors such as agriculture, fisheries, livestock, water, and sanitation.

1.1 STRATEGIC IMPORTANCE OF THE KINYASUNGWE CATCHMENT

The Kinyasungwe/Mkondoa Catchment, spanning about 16,500 km² across Dodoma and Morogoro regions and hosting over 1.6 million people, underpins critical national and regional economic activities:

- Agriculture and irrigation that secure food supplies and rural incomes.
- Livestock and fisheries vital for subsistence and commercial markets.
- Domestic and industrial water supply to fast-growing urban and peri-urban areas.
- Strategic transport infrastructure, notably the Central Railway Line, which is a key trade and mobility lifeline.

Since the 1940s, the catchment has been subject to increasingly destructive floods. The Kilosa–Dodoma railway section is particularly vulnerable, compelling TRC to spend TZS 3–6 billion annually on emergency repairs and suffer about TZS 2 billion in annual revenue losses due to service disruptions. Projected climate-change impacts (higher peak discharges and more frequent extreme storms) are expected to exacerbate these losses unless robust flood-risk controls are put in place.

1.2 EXISTING DAMS AND CHALLENGES

Between the 1950s and 1990s, six dams Kidete, Kimagai, Ikowa, Buigiri, Hombolo, and Dabalo, and an 8 km Mkondoa River embankment were built to provide flood control and irrigation. However, design and construction weaknesses, inadequate maintenance, and heavy sediment inflows have left most of these structures failed or severely degraded:

Dam	Year Built	Key Functions	Current Condition
Kidete	1997	Flood control & irrigation	Overtopped and partly washed away during the 1997 flood; reconstruction attempts stopped due to funding constraints.
Kimagai	1953	Flood control, irrigation, water supply	Collapsed within three years from spillway failure, embankment erosion, and siltation; never rehabilitated.
Ikowa	1957	Irrigation	Storage reduced from approximately 9,000,000 m³ to 1,000,000 m³ by sedimentation.
Buigiri	1957	Irrigation	Deteriorated embankment and spillway; very low dry-season storage.
Hombolo	1957	Irrigation & water supply	Effective water depth reduced from approximately 9 m to about 2 m; irrigation potential cut by more than half.
Dabalo	1957	Irrigation & domestic use	Highly silted and vulnerable to further sediment inflow.

Kidete and Kimagai dams form part of the broader Kinyasungwe/Mkondoa flood-risk management and irrigation system, together with Buigiri, Ikowa, Dabalo and Hombolo dams and other planned interventions. Within this assignment, the Consultant shall analyse the operation of these four dams in the context of the wider basin system, including (to the extent data allow) cumulative impacts and options for coordinated operation with Kidete and Kimagai to optimize flood attenuation, irrigation reliability and downstream risk reduction.

Root-cause analysis of historical performance and failures

As part of Phase I, the Consultant shall carry out a structured root-cause analysis of the historical failures and performance problems of all six dams in the Kinyasungwe system (Kidete, Kimagai, Buigiri, Ikowa, Dabalo and Hombolo). This shall include, as available, review of original design and construction documentation, inspection reports, monitoring data, photographs and interviews with knowledgeable stakeholders. For each dam, the Consultant shall identify the most likely failure modes and contributing factors (e.g. hydrological under-design, inadequate spillway capacity, embankment instability, seepage and piping, foundation defects, operational issues, sedimentation), and shall explicitly demonstrate in the revised or new designs how these failure modes are prevented or mitigated. The findings of this root-cause analysis shall be summarised in the

Phase I reports and used as a key input to the dam-safety strategy, PFMA, EAP and rehabilitation design.
Even recent achievements such as the Msagali Dam (92,000,000 m³) and Membe Dam (12,000,000 m³), which together irrigate more than 16,000 acres, underscore that every investment must be protected by rigorous design validation, climate-resilient engineering, and proactive sediment-management measures. At the same time, the condition of older dams in the catchment demonstrates how infrastructure without such safeguards becomes vulnerable to climate change, extreme hydrological events, and chronic maintenance gaps. This collective experience highlights the urgent need for robust, well-designed, and professionally managed flood-control and water-storage facilities to ensure long-term safety, functionality, and value for money.

1.3 PROPOSED INTERVENTIONS

The scope of services under this assignment is strictly limited to the rehabilitation and construction of the Kidete and Kimagai Dams, together with their associated works. Any activities related to detailed design review, tendering support, or construction supervision for Buigiri, Ikowa, Dabalo, and Hombolo Dams will be undertaken under a separate consultancy contract.
In this context, the Government, through the NIRC under TIRP-2, has prioritized the rehabilitation and construction of the Kidete and Kimagai Dams as flagship interventions. These projects are expected to:

- Provide effective flood attenuation and protection for downstream railway and road infrastructure.
- Restore reliable water storage for irrigation, fisheries, livestock, and domestic use.
- Stimulate local economic growth by improving agricultural productivity, rural livelihoods, and private investment.
- Contribute to long-term climate resilience and disaster-risk reduction in the Kilosa–Gulwe–Igandu corridor.

1.4 JUSTIFICATION FOR CONSULTANCY SERVICES

Although feasibility studies and preliminary designs have been recently done for the four priority dams, they require an independent technical review and updating to align with international best practice and dam safety standards, including:

- Re-validate hydrology and water balance under current and projected climate scenarios (including probable maximum precipitation and multi-day storm events).
- Conduct comprehensive geotechnical and seismic investigations, with special attention to foundation treatment, rapid drawdown conditions, and cut-off/drainage systems.

- Develop a sediment-management and reservoir-sustainability strategy for a minimum 50-year service life. Develop a sediment-management and reservoir-sustainability strategy to ensure an effective service life over a planning horizon of at least 75–100 years
- Sediment management and long-term reservoir sustainability:

The Consultant shall analyze sediment yield, transport and deposition for each reservoir over a planning horizon of not less than 75–100 years. The analysis shall, at a minimum, estimate trap efficiency, dead-storage requirements, progressive loss of active storage and impacts on intakes and spillways. The Consultant shall carry out sensitivity analysis of sedimentation and storage loss over different time horizons (e.g. 50, 75 and 100 years) and under alternative watershed-management assumptions, and shall use these results to develop a practical sediment-management and reservoir-sustainability strategy (including, as appropriate, catchment management measures, sediment routing / flushing options, provision for future dredging and operational rules). The recommended strategy and underlying assumptions shall be clearly documented and integrated into the final designs, operating rules and O&M plans.

- Integrate environmental and social safeguards in line with World Bank ESS4, ensuring community health, safety, and equitable benefit sharing.
- Prepare an Emergency Action Plan (EAP) with inundation mapping, early-warning instrumentation, and community-drill requirements.
- Carry out economic and life-cycle O&M cost analyses to ensure long-term value for money.

Furthermore, dedicated and independent construction supervision is essential to ensure that the works are executed to the highest standards of safety, quality, time, and cost control. The consultant will also be expected to provide capacity building to NIRC's technical staff, ensuring that skills are transferred and institutional capacity is strengthened for sustainable dam management. Accordingly, NIRC intends to engage a qualified Design Review and Supervision Consultant to deliver these services.

1.5 DAM SAFETY PANEL / PANEL OF EXPERTS

In line with the requirements of World Bank OP 4.37 / ESS4 and good international practice as reflected in ICOLD guidelines, the Employer will appoint (or may appoint) an independent Dam Safety Panel / Panel of Experts (PoE) for the project. The Panel will provide independent oversight and advice on dam safety aspects throughout the project cycle.
The Consultant shall collaborate closely with the Dam Safety Panel and shall:

- Prepare and submit to the Panel all key technical documents required for dam-safety review, including hydrological and hydraulic studies (design floods, dam-break and inundation analyses), geotechnical and structural investigations, design reports, PFMA or equivalent risk assessments,

construction quality-assurance plans, instrumentation and monitoring plans, Emergency Action Plans (EAP), and operation and maintenance (O&M) manuals;

- Participate, as requested by the Employer, in meetings and site visits of the Panel, present the proposed designs and analyses, and provide clarifications;
- Respond in writing to the Panel's comments and recommendations, including carrying out justified additional analyses or design refinements; and
- Integrate agreed dam-safety requirements and Panel recommendations into the final designs, EAP, O&M manuals and other relevant project documentation, clearly documenting how the Panel's comments have been addressed.

2.0 OBJECTIVES OF THE ASSIGNMENT

The primary objective of this consultancy is to ensure that the rehabilitation and construction of Kidete and Kimagai Dams are planned, designed, constructed, and commissioned in accordance with the highest standards of safety, quality, cost-effectiveness, and long-term sustainability, while simultaneously strengthening the institutional capacity of the National Irrigation Commission (NIRC).
Kidete and Kimagai Dams form part of a wider system of six strategic reservoirs in the Kinyasungwe sub-basin, together with Buigiri, Ikowa, Dabalo, and Hombolo Dams. Collectively, this reservoir system is intended to provide integrated flood attenuation, irrigation water supply, and drought-risk reduction for communities and critical infrastructure within the basin, including the Tanzania Railways Corporation's Central Line. The present assignment therefore focuses on Kidete and Kimagai, while explicitly recognising their functional interdependencies with the other dams in the Kinyasungwe system.

2.1 GENERAL OBJECTIVE

To engage a qualified and experienced Consultant to independently review, update, and finalize existing feasibility studies and detailed engineering designs, and to provide professional construction supervision and contract administration including comprehensive oversight during the defects liability period and the initial stages of operation.

2.2 SPECIFIC OBJECTIVES

The consultancy services shall pursue the following specific objectives:

a) Design Review and Validation

i) Comprehensive Design Review

Critically review and validate the feasibility studies, preliminary designs, and detailed engineering designs for Kidete and Kimagai Dams. Prepare a Design Basis Register (DBR) and conduct independent back-checks of key hydrologic, hydraulic, geotechnical, and structural calculations.

ii) Regulatory and Standards Compliance

Confirm full compliance with international dam-safety standards (including relevant ICOLD bulletins), Tanzanian dam-safety regulations, and the World Bank's Environmental and Social Framework (ESS4) and Dam Safety Policy (OP 4.37). Prepare a compliance matrix highlighting requirements for World Bank no-objection.

iii) Design Updating and Coordination

Update and integrate all designs where necessary, including coordinated drawings, specifications, Bills of Quantities (BoQs), and cost estimates, ensuring that quantities, technical specifications, and cost assumptions remain coherent and verifiable.

iv) Risk Identification and Mitigation

Identify and evaluate risks related to sedimentation, foundation conditions, seismic activity, hydrological variability, and climate-change extremes. Prepare a risk register and propose mitigation measures supported by Potential Failure Modes Analysis (PFMA), climate-stress testing, and scenario planning.

v) Validation of Consultant Deliverables

Verify the feasibility studies, engineering designs, and tender documents prepared by earlier design consultants. Ensure internal consistency among design criteria, calculations, drawings, specifications, and BoQs, and confirm constructability and long-term O&M provisions.

vi) Verification of Design Criteria and Methods

Review and confirm the adequacy of design criteria, methodologies, and assumptions, including but not limited to flood routing, probable maximum precipitation (PMP), seismic loading, slope and structural stability, seepage control, and instrumentation layouts. Perform independent spot calculations for governing cases.

vii) Integration of Climate Resilience and Long-Term Safety

Ensure that designs explicitly incorporate climate-resilient engineering, sediment management, and long-term dam-safety monitoring. Require a sediment-management plan, life-cycle O&M cost estimates, and a detailed instrumentation and monitoring manual with trigger levels and early-warning protocols.

viii) Failure Mode Assessment and Emergency Preparedness

Identify potential design weaknesses or failure modes and recommend improvements in line with ICOLD standards, OP 4.37, and ESS4. Prepare an Emergency Action Plan (EAP) including inundation mapping, downstream risk analysis, and community-drill requirements. Provide a comment-and-resolution log and a prioritized action plan for all non-conformities.

b) Preparation of Bidding Documents

i) Finalize bidding documents for construction works based on the reviewed and updated designs, ensuring full compliance with World Bank procurement regulations and Tanzanian public procurement law.

ii) Provide technical support to NIRC during tendering, including clarifications, addenda, and evaluation of design-related queries.

c) Construction Supervision and Contract Administration

i) Supervise construction activities to ensure strict compliance with approved designs, technical specifications, environmental and social safeguards, and the agreed Quality Assurance/Quality Control (QA/QC) plan.

ii) Administer the works contract, including review of contractor's work programs, verification of progress, approval of materials and methods, and certification of payments.

iii) Oversee geotechnical, structural, hydraulic, and electromechanical works, supported by laboratory and field testing.

iv) Monitor and report on progress, costs, risks, and quality, and recommend timely corrective measures.

v) Support the Employer in claims management, dispute avoidance, and resolution, ensuring contractual integrity and fairness.

d) Defects Liability Period Oversight

i) Inspect and monitor the dams during the Defects Liability Period (DLP) to identify, document, and ensure correction of deficiencies.

ii) Certify final acceptance of works and prepare closure documentation, including as-built drawings, updated O&M manuals, and lessons-learned records.

e) Capacity Building and Knowledge Transfer

i) Provide structured on-the-job training and mentoring for NIRC's counterpart staff in dam engineering, contract administration, environmental and social safeguards, instrumentation, and quality control.

ii) Enhance NIRC's institutional capacity to plan, manage, and maintain large dams, including future periodic dam-safety audits and long-term O&M budgeting.

3.0 SCOPE OF SERVICES

The assignment entails the provision of independent, end-to-end design review and construction supervision for the proposed dams and associated flood-control works under Component 2 of TIRP-2. Acting as the Client's independent professional advisor, the Consultant will accompany the project from the earliest design-validation stage through construction, commissioning, and final hand-over—ensuring that each phase meets the highest technical, safety, environmental, and social standards.

The consultancy will begin with a feasibility-confirmation phase in which the Consultant will critically review and validate the full feasibility study and detailed engineering designs for Kidete and Kimagai Dams. This "second professional opinion" will confirm that all hydrological, geotechnical, structural, seismic, environmental, and economic analyses are technically sound and fully aligned with the Project Agreement between IDA and NIRC, the World Bank's Dam Safety requirements (OP 4.37), ESS4 on Community Health and Safety, and applicable ICOLD guidelines. Upon validating these designs, the Consultant will support the procurement process by reviewing tender documents, technical specifications, and Bills of Quantities (BoQs), and by advising on contract packaging and evaluation to ensure consistency, completeness, and value for money.

In performing the services, the Consultant shall adopt a basin-wide, systems-thinking perspective for the Kinyasungwe sub-basin. Hydrological and hydraulic assessments including design-flood estimation, flood routing, sediment dynamics, and reservoir-operation analyses, shall consider upstream and downstream interactions and, as far as data allow, interface with the wider reservoir system comprising Buigiri, Ikowa, Dabalo, and Hombolo. For clarity, however, the detailed design review, procurement support, and construction-supervision obligations under this ToR apply strictly to Kidete and Kimagai; any rehabilitation or construction works at the other dams will be addressed under separate assignments.

During construction, the Consultant will maintain a continuous supervision and quality-assurance presence. Responsibilities will include reviewing and approving construction methodologies and materials, monitoring compliance with dam-safety, environmental, and social requirements, overseeing the implementation of corrective design measures, and obtaining World Bank no-objection where required. The Consultant will further supervise the installation, testing, and commissioning of dam-safety instrumentation and emergency-preparedness measures.

The assignment also extends into the initial operation and hand-over stage. Here, the Consultant will verify completion of works against specifications, support performance testing, and ensure the preparation and submission of complete as-built drawings, long-term monitoring plans, and comprehensive operation and maintenance (O&M) manuals with life-cycle costing.

Capacity building and knowledge transfer will be embedded throughout all phases of the assignment. The Consultant will deliver structured training, technical coaching, and on-the-job mentoring to enhance NIRC's long-term capability for safe and sustainable dam operation and maintenance, while providing NIRC and the World Bank with regular progress, safeguard-compliance, and technical-quality reports. In doing so, the consultancy provides a coherent, integrated service that upholds technical excellence, regulatory compliance, and climate-resilient dam development from project inception through to safe, fully documented operation.

3.1 Phase I – Design Review and Validation

Forensic review of historical performance and failures

The Consultant shall undertake a comprehensive forensic assessment of the historical performance and reported failures of Kidete and Kimagai Dams. This will include, as available, a review of original design documents, construction records, photographs, inspection reports, maintenance logs, and interviews with key stakeholders. The assessment shall identify the most probable failure modes and their contributing factors such as hydrological under-design, inadequate spillway capacity, embankment instability, foundation defects, seepage and piping risks, and operational shortcomings. The Consultant must explicitly demonstrate in the revised designs how each identified failure mode will be prevented or mitigated through improved design, construction, and operational controls.

Hydrological modelling – calibration and validation

The Consultant shall develop or update hydrological models for the relevant catchments using recognised modelling tools. These models must be calibrated and validated against all available observed rainfall, streamflow, and/or reservoir water-level data. The submission shall clearly document the model structure, data sources, calibration processes, goodness-of-fit statistics, key assumptions, and sources of uncertainty. The Consultant shall present a clear statement on the reliability, confidence level, and limitations of the resulting design-flood estimates to guide risk-informed decision-making.

Climate-change and climate-variability scenarios
The hydrological design must be stress-tested under multiple plausible climate-change scenarios (e.g., at least one median, one wetter, and one drier future scenario). These scenarios shall be derived from recognized regional or global climate projections and downscaling methods. The Consultant shall analyze the sensitivity of inflows, reservoir yields, design floods, and spillway requirements to these scenarios, and recommend robust design values that ensure long-term dam safety, operability, and climate resilience.

Sediment management and reservoir sustainability
The Consultant shall undertake a full sediment-yield and reservoir-sedimentation assessment for planning horizons of not less than 75–100 years. This analysis shall estimate sediment yield, transport, deposition patterns, trap efficiency, dead-storage requirements, active-storage loss rates, and potential impacts on intakes, spillways, and outlets. Based on the findings, the Consultant shall propose a sediment-management and reservoir-sustainability strategy incorporating watershed-management options, sediment routing or flushing, adaptive operational rules, and where feasible future dredging or structural retrofits. These recommendations shall be integrated into the revised designs, reservoir-operation rules, and O&M plans.

Overall purpose of Phase I
In the first phase of the assignment, the Consulting Firm will serve as an independent professional reviewer to provide a second technical opinion on the complete feasibility study and detailed engineering designs for the Kidete and Kimagai Dams Project. The objective is to validate and, where necessary, update every key aspect of the design so that construction can proceed with full assurance of technical soundness, economic viability, environmental and social sustainability, and compliance with: The Project Agreement between IDA and NIRC; The World Bank's Dam Safety Policy (OP 4.37) and Environmental and Social Framework (ESS4: Community Health and Safety), and; International Commission on Large Dams (ICOLD) standards and all applicable Tanzanian laws and engineering codes.

The Consultant shall carry out, but not necessarily be limited to, the following tasks:

a) Review and Validation of Feasibility Studies and Designs

Examine all feasibility studies, preliminary designs, and detailed engineering designs already prepared for the two dams. Identify data gaps, inconsistencies, and outdated assumptions, and recommend corrective measures.

b) Verification and Updating of Core Technical Inputs

The Consultant will **verify and, where necessary, update** all technical data and analyses to ensure their reliability and compliance with best practice:

i) **Topographic surveys and site layouts:** Reassess all topographic surveys and confirm the location of permanent control points, dam axes, spillways, appurtenant structures, borrow areas, quarry sites, and access roads. Re-compute earthwork quantities and verify that site layouts optimize both safety and construction efficiency.

ii) **Geotechnical and seismic investigations:** Review all foundation investigations and seismology test reports. Evaluate the stability of foundations, embankments, and appurtenant structures under static, rapid drawdown, and seismic conditions. Provide specific design guidance to address seismic effects and to ensure long-term embankment and structural safety.

iii) **Hydrological and hydraulic studies:** Update rainfall–runoff and flood-frequency analyses; confirm water balance, reservoir routing, sediment yield, and probable maximum flood (PMF) estimates. Undertake climate-stress testing (including probable maximum precipitation and multi-day storm events) to verify that spillways and flood-protection structures can safely pass extreme hydrological events.

iv) **Design assumptions, drawings, and specifications:** Check that design criteria, calculations, and drawings are internally consistent and meet ICOLD, Tanzanian, and World Bank standards. Validate hydraulic and structural design of reservoirs, spillways, flood dykes, retaining walls, intakes, bottom outlets, gates, and other major works.

v) **Dam safety risk analysis:** Conduct a comprehensive Potential Failure Modes Analysis (PFMA), review the dam and reservoir safety plans, and ensure that Emergency Action Plan (EAP) requirements including inundation mapping, early-warning instrumentation, and community-drill provisions are fully integrated into the final design.

vi) **Environmental and social safeguards:** Review Environmental and Social Impact Assessments (ESIA) and confirm that mitigation measures and Environmental and Social Management Plans (ESMP) are fully integrated into the engineering designs and operational plans.

vii) **Economic and financial analysis:** Reassess project economics and life-cycle costs, confirm that the priced Bill of Quantities reflects prevailing construction market rates, and ensure overall value for money and long-term viability.

c) Preparation of Updated, Construction-Ready Designs

Where updates or modifications are required, prepare final construction-ready design documentation, including final drawings, comprehensive technical specifications, priced and itemized BoQs, confidential cost estimates, and a

realistic construction schedule aligned with procurement milestones and seasonal conditions.

d) Operation and Maintenance Planning

Review and refine the O&M plan, including reservoir operation rules, inspection procedures, **sediment management strategies**, periodic dam-safety audits, and budgetary provisions to ensure sustainable performance and dam safety.

e) Reviewed Design Report

Compile a Reviewed Design Report that summarizes the independent review, justifies any modifications or additional investigations, and presents final construction-ready documents, cost estimates, and an improved O&M plan.

3.2 Phase II – Preparation of Bidding Documents and Tender Assistance

After design review and validation, the Consultant will support the procurement of construction works by preparing complete, high-quality bidding documents and providing professional assistance throughout tendering, in full compliance with the World Bank Procurement Regulations (latest edition), the Financing Agreement, and applicable Tanzanian procurement laws.

The Consultant shall undertake, but not necessarily be limited to, the following tasks:

a) Preparation of Complete Bidding Documents

i) Draft comprehensive bidding packages for the construction of the dams and all associated flood-control and ancillary works, including:

- Instructions to Bidders (ITB) and Bid Data Sheet (BDS).
- Conditions of Contract (General and Particular), clearly defining the Consultant's role as Engineer/Employer's Representative.
- Technical Specifications, detailed drawings, and design criteria consistent with the Reviewed Design Report.
- Bills of Quantities (BoQ), confidential cost estimates, and payment schedules.
- Environmental and Social Management Plan (ESMP), labour and occupational health & safety requirements, and other safeguard provisions.
- Requirements for performance security, insurance, defect liability, and warranties.

ii) Ensure clarity and consistency between all sections of the bidding documents, eliminating ambiguities that could lead to disputes or claims.

iii) Incorporate risk management and climate resilience measures, including specifications for dam-safety instrumentation, sediment-control structures, and emergency preparedness plans.

b) Tender Assistance and Bid Evaluation Support

i) Support the tendering process in coordination with NIRC's Procurement Management Unit (PMU), ensuring adherence to both national and World Bank procurement procedures and timelines.

ii) Respond to design-related clarifications, issue addenda when required, and provide timely technical explanations to prospective bidders during the advertising and bidding period.

iii) Provide professional input during bid opening and evaluation, including: Reviewing the technical responsiveness of bids; Analyzing construction methods, schedules, and proposed staffing and equipment; Checking rates against current market prices and the confidential cost estimate to identify abnormally low or high bids.

iv) Participate in evaluation committee deliberations as a technical resource person, without compromising the independence of the Employer's formal evaluation.

v) Recommend necessary adjustments to technical specifications, drawings, or cost estimates where market feedback reveals gaps or unforeseen constraints.

vi) Support contract finalization, assisting NIRC in addressing any post-evaluation clarifications and ensuring that the draft contract is complete and ready for World Bank no-objection and signature.

c) Deliverables

i) Draft and final bidding documents (hard and electronic copies).

ii) Written responses to bidder clarifications and any issued addenda.

iii) Technical evaluation memoranda and recommendations.

iv) Final contract-ready documents reflecting any agreed changes.

3.3 Phase III – Construction Supervision and Contract Administration

During this phase, the Consultant will act as the **Engineer/Employer's Representative** as defined in the works contract, within the authority delegated by the Employer.

The Consultant will provide **independent, continuous supervision and full contract administration** to ensure that all works are executed safely, on time, within budget, and to the specified quality standards.
The duties will cover the following main areas:

a) Contract Administration

i) **Review and approval of contractor's submissions:** Examine and approve work programs, method statements, quality-control plans, staffing proposals, and equipment mobilization schedules.

ii) **Management of contract changes:** Evaluate and certify interim payment certificates, contract variations, price adjustments, and requests for time extensions in accordance with the Conditions of Contract.

iii) **Progress monitoring and scheduling:** Track construction progress using modern project-management and construction-monitoring tools; identify actual or potential delays and recommend timely corrective actions.

iv) **Documentation and records:** Maintain a complete, indexed record of all correspondence, instructions, reports, test data, drawings, and site diaries for contractual and audit purposes.

v) **Claims and dispute resolution support:** Advise and assist the Employer in evaluating and negotiating claims, and provide expert input in any disputes, appeals, or arbitration that may arise.

b) Construction Supervision and Quality Control

i) **Inspection and approval of materials and workmanship:** Verify sources, carry out laboratory and field tests (soils, concrete, aggregates, filters, mechanical and electrical components), and approve only those materials and works that meet the specifications.

ii) **Enforcement of the Quality Assurance Plan:** Implement the agreed plan for systematic sampling, testing, and acceptance criteria. Maintain traceable records of all tests and inspections, including geo-tagged photo documentation.

iii) **Compliance with design and specifications:** Ensure that construction strictly follows approved drawings and specifications and good engineering practice; review and clear any design modifications, with formal no-objection from the World Bank where required.

iv) **Risk and safety control:** Identify defects or unsafe conditions and issue immediate instructions, including “stop-work” notices, when safety or quality is at risk.

v) **Verification of as-built records:** Review and certify contractors’ as-built drawings, ensuring full consistency with works executed and instrumentation installed.

c) Dam-Safety and Safeguards Compliance

i) **Dam-safety measures:** Supervise installation, calibration, and commissioning of dam-safety instrumentation (piezometers, settlement gauges, inclinometers, etc.); oversee first reservoir filling and confirm implementation of emergency preparedness and dam-break contingency plans.

ii) **Environmental and Social Management Plan (ESMP):** Monitor and enforce ESMP implementation, including occupational health and safety, labour welfare, traffic safety, pollution control, and community health and safety.

iii) **Grievance redress and stakeholder engagement:** Facilitate grievance-handling mechanisms and community consultations, and document the resolution of issues.

iv) **Safeguards reporting:** Provide monthly and quarterly ESMP compliance reports, highlighting non-conformities and recommending corrective actions.

d) Reporting and Stakeholder Coordination

i) **Periodic reporting:** Prepare and submit inception, monthly, quarterly, and completion reports that summarize progress, financial status, quality findings, ESMP compliance, and key decisions.

ii) **Stakeholder liaison:** Coordinate with the Project Coordinator, Local Government Authorities (LGAs), TRC, and other relevant agencies to resolve site constraints (e.g., utility relocation, land access).

iii) **Progress reviews and meetings:** Conduct regular site meetings and progress reviews, ensuring that decisions are minuted and promptly acted upon.

3.4 Phase IV – Oversight During Defects Liability Period

The Consultant will provide independent supervision and advisory services throughout the Defects Liability Period (DLP), expected to last one year (365 days)

after substantial completion, to ensure that the works remain in full compliance with design and safety requirements. The Consultant shall:

a) Periodic inspections and testing: Carry out scheduled and surprise inspections to monitor the condition of the dams, appurtenant structures, and mechanical/electrical equipment, and to detect latent defects.

b) Defect identification and rectification: Prepare and update a comprehensive defect list, notify the contractor of required remedial measures, and monitor timely correction of each item.

c) Certification and documentation: Verify and certify that all defects have been rectified; prepare and submit periodic defect reports with details of remedial actions and costs incurred.

d) Final acceptance and hand-over: After satisfactory correction of defects, conduct a joint final inspection with the Employer, confirm the accuracy of as-built drawings, and finalize the Operation and Maintenance (O&M) manual and all records of defect correction.

e) Final payment and closure: Review and clear any outstanding claims and prepare the Final Defects Liability Report and Acceptance Certificate in consultation with the Employer.

3.5 Capacity Building and Knowledge Transfer

Capacity building is an integral part of the assignment. The Consultant shall:

a) Prepare a **Capacity Building Plan** in the inception report.

b) Attach up to seven (7) NIRC counterpart staff covering dam engineering, irrigation, agronomy, sociology, environment, and land surveying.

c) Provide **on-the-job training** in:

   i) Dam design, safety, and supervision techniques.

   ii) Contract administration and FIDIC principles.

   iii) QA/QC and laboratory/field testing.

   iv) Safeguards monitoring and stakeholder engagement.

d) Conduct at least two formal training workshops during the assignment.

e) Document knowledge transfer activities in periodic reports.

4.0 DELIVERABLES AND REPORTING REQUIREMENTS

This section provides the complete and authoritative list of all reports, drawings, models and other outputs to be produced under this assignment, together with their timing and number of copies. To avoid duplication and possible inconsistencies, all requirements related to “expected outputs”, “final deliverables” and “handover package” are fully consolidated here.

- Inception Report
- Phase I / Reviewed Feasibility and Design Report(s)
- Draft Final Design Report(s) and Bidding Documents
- Final Design and Tender Documentation
- Construction Supervision reports (monthly, quarterly, etc.)
- EAP, O&M manuals, as-built drawings
- Final completion / project completion report
- Final consolidated handover package / digital archive

The Consultant shall prepare and submit all reports, designs, drawings, and records in clear technical English, providing at least five (5) bound hard copies and complete editable electronic versions (Word, Excel, AutoCAD, and PDF). Each deliverable shall include executive summaries, supporting data, annexes, tables, drawings, and photographic or geo-referenced documentation where relevant.
All submissions must meet the standards of the Project Agreement, the World Bank (OP 4.37 and ESS4), ICOLD guidelines, and applicable Tanzanian regulations.
Deliverables are organized by project phase and incorporate continuous capacity building and knowledge transfer requirements.

4.1 Phase I – Design Review and Validation

Deliverable	Timing	Key Contents
Inception Report	Within **3 weeks** of contract commencement	Consultant’s organization and staffing plan; detailed work methodology and schedule; initial site and data observations; a comprehensive Capacity Building Plan for NIRC counterpart staff; and a digital project document repository plan.
Reviewed Feasibility and Design Report	Within **3 months**	Critical review of feasibility studies and detailed designs; verified topographic, geotechnical, hydrological, seismic and ESIA data; climate-stress hydrology and sediment yield analyses; identification of data gaps; and

Deliverable	Timing	Key Contents
		recommendations for design updates to ensure compliance with ICOLD, World Bank, and Tanzanian standards.
Draft Final Design Report	Within **5 months**	Construction-ready updated designs, drawings, specifications, and BoQs; geotechnical and hydrological investigation reports; cost estimates and construction schedule; draft bidding documents in World Bank format; instrumentation and monitoring plan; and draft Emergency Action Plan (EAP).
Final Design and Bidding Documents	Within **1 month** of receiving comments	Incorporation of Employer and stakeholder feedback; final, ready-to-use bidding documents including technical specifications, final drawings, priced BoQs, confidential cost estimates, ESMP and EAP requirements, and a finalized Operation and Maintenance (O&M) plan with life-cycle cost projections.

The Reviewed Feasibility and Design Report(s) for each dam shall, in addition to the narrative and drawings, include at least the following key technical annexes and tools:

- A Design Basis Register (DBR), summarising all design criteria and key assumptions, including hydrological, hydraulic, geotechnical, structural, operational, environmental and social parameters, with clear references to data sources, codes/standards and justification for selected values.
- A Potential Failure Modes Analysis (PFMA) summary and risk register, identifying the principal potential failure modes, their causes, estimated likelihood and consequences, existing and proposed risk-reduction measures, and residual risks.
- A climate-stress hydrology annex, presenting the hydrological analysis under multiple climate scenarios, including methods, data sources, design-flood estimates, sensitivity analysis and a brief discussion of uncertainties and implications for dam safety and operation.
- A sediment-management and reservoir-sustainability plan, including estimates of sediment yield and deposition over the agreed planning horizon, trap efficiency, loss of active storage, and recommended structural and non-structural sediment-management measures.
- An outline Emergency Action Plan (EAP) for each dam, providing at minimum: the proposed structure and contents of the full EAP; preliminary inundation mapping and key warning/alert zones based on the dam-break / inundation analysis; an outline of roles and responsibilities of relevant

institutions; and an outline communication and warning protocol to be refined during subsequent phases.

Each design-stage report shall also include a **record of knowledge transfer** to NIRC staff.

4.2 Phase II – Preparation of Bidding Documents and Tender Assistance

Deliverable	Timing	Key Contents
Final Bidding Package	Concurrent with completion of Phase I	Complete set of bidding documents (ITB, BDS, Conditions of Contract, technical specifications, drawings, BoQs, ESMP provisions, and contract forms) ready for World Bank no-objection.
Tender Support Memoranda	As required during advertising and bid evaluation	Written responses to bidder clarifications; addenda issued; minutes of pre-bid meetings.
Technical Evaluation Input Report	Upon completion of bid evaluation	Professional analysis of bid responsiveness, construction methods and schedules, market-rate verification, and recommendations on contract award.
Contract Finalization Note	Prior to contract signing	Confirmation that all agreed technical and commercial adjustments have been incorporated in the contract for signature.

4.3 Phase III – Construction Supervision and Contract Administration

Deliverable	Timing	Key Contents
Supervision Inception Report	Within **2 weeks** of contractor mobilization	Review of the contractor's work program, staffing, and method statements; supervision methodology; updated QA/QC plan; and schedule for first reservoir filling and dam-safety instrumentation installation.
Monthly Progress Reports	Within **7 days** after month-end	Physical and financial progress; key activities completed and planned; laboratory and field test results; instrumentation readings and dam-safety observations; safeguards compliance (ESMP, OHS, community engagement); key risks and recommended corrective actions.

Deliverable	Timing	Key Contents
Quarterly Progress Reports	Within **14 days** after quarter-end	Consolidated assessment of progress, costs, claims and variations; updated schedules; geo-tagged photo documentation of works; and evaluation of climate- and sediment-related performance.
Variation and Claims Reports	As required	Technical justification and cost/time implications of proposed variations; evaluation of contractor's claims.
Special Technical/Safeguards Reports	As required	Design-change requests, dam-safety incidents, or any event requiring World Bank no-objection, including emergency preparedness activations.
Construction Completion Report	At substantial completion of works	Summary of works executed, quality achieved, and costs incurred; as-built drawings and verified instrumentation data; updated O&M manual with long-term maintenance schedule; and lessons learned.

All reports shall clearly document quality assurance measures, non-conformities detected and rectified, and the progress of capacity building and training for NIRC staff.

4.4 Phase IV – Oversight During Defects Liability Period (DLP)

Deliverable	Timing	Key Contents
Defects and Maintenance Schedule	At start of the one-year DLP	List of outstanding defects, rectification plan, and maintenance schedule agreed with the contractor.
DLP Inspection Reports	At least every **4 months** or as directed	Inspection findings, defects identified, actions taken, and confirmation of continued compliance with dam-safety and environmental requirements.
Final DLP Report and Acceptance Certificate	At end of DLP	Confirmation that all defects have been rectified; certification of final acceptance; complete record of remedial works; and consolidated project documentation for archiving.

4.5 Capacity Building and Knowledge Transfer

Capacity building is cross-cutting and will be reported in every phase. Key deliverables include:

a) Capacity Building Plan: Incorporated in the Phase I Inception Report, detailing training topics, schedules, and responsibilities.

b) Training Session Reports: Prepared after each formal workshop or structured on-the-job training session, documenting participants, content, and competencies gained.

c) Final Capacity Building Report: At project closure, summarizing all training, on-the-job mentoring, and knowledge transfer outcomes, with recommendations for sustaining institutional capacity.

4.6 General Reporting Provisions

a) All deliverables shall be concise, evidence-based, and decision-oriented, highlighting required actions and responsibilities.

b) Drawings shall be delivered in both CAD and PDF formats; final documentation will be provided as organized electronic archives (Word, Excel, AutoCAD, PDF).

c) The Consultant shall maintain an up-to-date digital project document repository, with controlled access for NIRC and the World Bank throughout the assignment.

d) All reports shall include a summary of EAP readiness and instrumentation status to ensure continuous dam-safety oversight.

In view of the volume of digital outputs to be produced under this assignment (including models, drawings, reports, GIS data and other datasets), the Consultant shall prepare and deliver a structured digital archive of all project documentation on agreed media (e.g. external hard drive[s]). The archive shall:

- Be organised using a clear and logical folder hierarchy, at a minimum by dam (e.g. Kidete, Kimagai / Buigiri, Ikowa, Dabalo, Hombolo) and by project phase (e.g. Phase I – Design Review and Detailed Design; Phase II – Tendering; Phase III – Construction Supervision; Phase IV – DLP and Handover);

- Apply consistent file-naming conventions that clearly indicate, as appropriate, the dam name, document type, version and date (for example: Buigiri_PhaseI_HydrologyReport_v02_2027-03-15.pdf);

- Include a master index (for example, an Excel register) listing all files in the archive, with at least the following fields: file name, title/description, dam, phase, document type (report, drawing, model, dataset, correspondence, etc.), version, date and any relevant remarks; and

- Clearly identify the final approved versions of all reports, drawings, models and key datasets and distinguish them from draft or working versions.

The digital archive shall be structured and documented in a way that facilitates its long-term use by NIRC, the Ministry of Water Dam Safety Unit and the World Bank for subsequent dam-safety reviews, monitoring and operation and maintenance.

5.0 QUALIFICATIONS OF THE CONSULTING FIRM AND KEY STAFF REQUIREMENTS

5A. Institutional Qualifications of the Consulting Firm

The consulting firm must demonstrate:

a) At least **15 years of proven experience** in the design review and supervision of large dams and hydraulic structures.

   In order to be considered "similar in nature and complexity", at least two (2) of the reference assignments shall have involved large dams (as per the applicable national or World Bank dam-safety definition) and shall have included, as core elements: Dam safety assessment and/or design review; preparation or updating of Emergency Action Plans (EAP) including dam-break and inundation analysis, and; construction supervision and contract administration for dam rehabilitation or new dam works.
   Assignments limited to irrigation conveyance systems or generic hydraulic works, without a substantial dam-safety and EAP component, shall not by themselves be considered sufficient to meet this requirement**.**

b) Successful completion of at least **three assignments** of similar scope and complexity in the past 10 years, preferably funded by international development partners.

c) Access to specialized software (hydrological, geotechnical, structural, and project management).

d) Availability of adequate support facilities (office, transport, field equipment).

5B. Personnel Qualifications

The Consultant shall mobilize a multidisciplinary team of highly qualified professionals with proven expertise in dam design, construction supervision, irrigation engineering, and social and environmental management. Personnel must have the qualifications and experience necessary to perform project tasks to a high standard and to complete each project component efficiently and on schedule. A single expert may be proposed for more than one position if he or she meets the qualifications and has the required breadth of experience. The indicative core team and their minimum requirements are set out below. The Consultant shall also deploy supporting and back-up staff as necessary to achieve all deliverables.
Key experts proposed for the positions of Team Leader, Dam Safety Engineer, Hydrologist and Geotechnical Engineer shall each demonstrate specific

experience on dam-safety projects for large dams, including, as relevant to their role, EAP preparation, dam-break and inundation analysis, and construction supervision of dam rehabilitation or new dam works. Generic experience limited to irrigation or other hydraulic projects, without a substantive dam-safety focus, will be considered insufficient.
To ensure adequate capacity and independence in critical functions, one individual shall not be proposed for more than one of the following key positions: Team Leader, Hydrologist, Dam Safety Engineer, Geotechnical Engineer, Safeguards/Safeguard Specialist. Each of these positions shall be staffed by a separate qualified expert.

5.1 Team Leader – Senior Civil/Water Resources/Irrigation Engineer

a) Role

The Team Leader will provide strategic leadership, technical direction, and overall management of the consultancy assignment. Serving as the principal liaison with NIRC, the Contractor, Government authorities, and international financiers, the Team Leader will ensure that all aspects of the design review and construction supervision are fully coordinated, technically sound, and aligned with the assignment's objectives. He/she will oversee planning, quality assurance, deliverable submission, stakeholder coordination, and timely implementation of all activities from Phase I through commissioning and hand-over.

b) Qualifications

The Team Leader shall be a Civil, Water Resources, or Irrigation Engineer with:

i) Degree or higher in Civil, Water Resources, Irrigation, or Agricultural Engineering from a recognized university.

ii) Registered professional engineer.

iii) At least **15 years' experience** in the design of irrigation systems, headworks, and large hydraulic structures, with extensive knowledge of modern irrigation engineering.

iv) Proven leadership on complex irrigation or dam projects in Sub-Saharan Africa (desirable).

v) At least ten (10) years of experience as a Team Leader or Deputy Team Leader on large dam and/or major water-resources development projects, including rehabilitation and safety upgrades of existing dams.

vi) Proven experience in design review, construction supervision, and contract administration of dam or major hydraulic-infrastructure works financed by Multilateral Development Banks (e.g., World Bank, AfDB) or comparable institutions.

vii) Demonstrated ability to lead multidisciplinary teams, including hydrologists, geotechnical engineers, structural engineers, environmental and social specialists, and dam-safety experts.

viii) Demonstrated ability to coordinate effectively with Government agencies, project implementation units, and international development partners.

Note: Experience limited to small-scale irrigation systems or generic water-supply projects without substantive dam-safety or construction-supervision responsibilities shall be considered insufficient for this position.

c) Main Responsibilities

i) Coordinate the work of the consultancy team and ensure adherence to the approved implementation programme.

ii) Serve as the focal contact between the Client and all team members.

iii) Formulate and oversee the overall programme for developing irrigation schemes and associated works.

iv) Lead the preparation and timely submission of all required reports and deliverables (Inception, Monthly Progress, Interim, Draft Final, and Final).

v) Manage relationships with NIRC departments, contractors, regional and central government offices, and external stakeholders, including farmers and non-governmental organizations.

vi) Prepare detailed, time-bound work plans and assign tasks to team members.

vii) Provide technical guidance and support across all aspects of the consultancy services.

viii) Organize and lead regular site and service-area visits for technical supervision, including surveys, mapping, and confirmatory tests.

ix) Monitor progress of all planning and design work to ensure compliance with agreed schedules and quality standards.

x) Delegate and supervise additional tasks or activities as required to meet project objectives.

xi) Maintain rigorous quality control over all outputs and ensure that both printed and electronic versions of deliverables, including tables and figures, are furnished to the Client for efficient review.

5.2 Civil / Irrigation / Agro Engineer – Dedicated to Schemes during Feasibility Study

a) Role

Lead feasibility investigations and engineering design studies for irrigation schemes and command areas, ensuring that all designs are technically sound, cost-effective, and meet project objectives.

b) Qualifications

i) Bachelor's degree in Civil, Agricultural, or Irrigation Engineering (or an equivalent field) from a recognized institution.

ii) **Minimum 7 years** of professional experience, including at least **4 projects** focused on planning and design of irrigation systems.

c) Main Responsibilities

i) Conduct comprehensive feasibility and design studies for all irrigation schemes within the project scope.

ii) Update and improve existing drainage assessments and identify areas requiring intervention.

iii) Determine current and future crop water requirements, accounting for conveyance and on-farm efficiencies, and establish irrigation water demand.

iv) Prepare detailed location maps and provide a concise description of each project site.

v) Develop general layouts of service areas, irrigation networks, and drainage systems.

vi) Prepare accurate quantity and cost estimates for all irrigation infrastructure.

vii) Define the proposed implementation and organizational arrangements for project execution.

viii) Prepare detailed construction and disbursement schedules.

ix) Provide complete mapping, drawings, and documentation to support technical and financial decision-making.

x) Undertake any other tasks assigned or delegated by the Team Leader in support of the feasibility study.

5.3 Civil / Irrigation Engineer – Dedicated to Schemes during Construction Supervision

a) Role

Serve as the **resident site engineer** responsible for day-to-day supervision of irrigation and hydraulic works. Ensure that all construction activities comply with approved designs, specifications, contractual requirements, and applicable safety and quality standards.

b) Qualifications

i) Bachelor's degree in Civil or Irrigation Engineering (or equivalent) from a recognized university.

ii) **Minimum 5 years** of professional experience, including at least **4 projects** in construction supervision of irrigation systems.

iii) Registered professional engineer.

c) Main Responsibilities

i) Provide full-time, on-site management of construction works, acting as the site manager and primary technical authority.

ii) Supervise execution of works and verify completed sections prior to taking over.

iii) Check plans, drawings, and quantities for accuracy, and confirm that all materials and workmanship conform to specifications.

iv) Maintain timely and accurate site records, including daily logbooks, measurement books, and all contractor reporting forms.

v) Prepare and submit weekly and monthly progress reports and other required documentation.

vi) Issue instructions to the contractor as stipulated in the contract and ensure full adherence to contractual terms and conditions.

vii) Monitor and enforce compliance with health, safety, and environmental standards.

viii) Certify interim payment certificates and verify quantities presented by the contractor.

ix) Organize and lead monthly site meetings, preparing detailed minutes and action plans.

x) Implement all activities on the NIRC (Client) checklist and provide fortnightly and monthly updates.

xi) Supervise and monitor the site labor force and any subcontractors, ensuring continuous quality control.

xii) Undertake any other construction-related duties assigned or delegated by the Team Leader to meet project objectives.

5.4 Hydrologist

a) Role

The Hydrologist will lead all hydrological, catchment-water-balance, and flood-estimation analyses required for the design review and construction supervision of the Kidete and Kimagai Dams. He/she will ensure that rainfall runoff modelling, design-flood estimation, climate-stress testing, and reservoir-operation assessments fully comply with ICOLD, World Bank ESS4, and accepted international dam-safety practice.

b) Qualifications

i) Bachelor's degree in Hydrology, Water Resources Engineering, Civil Engineering, or a closely related discipline from a recognised institution. A Master's degree is an added advantage.

ii) A minimum of ten (10) years of professional experience, including at least five (5) years on hydrological studies for large dams or multipurpose reservoirs.

iii) Proven competence in rainfall–runoff modelling, flood-frequency analysis, extreme-event estimation, and climate-stress testing using recognised hydrological tools (e.g., HEC-HMS, SWAT, WRAP, or equivalent).

iv) Demonstrated ability to prepare design flood hydrographs, formulate reservoir-operation rules, analyse sediment yield, and support system-wide water-resources assessments.

c) Main Responsibilities

i) Review and verify all hydrological inputs and assumptions used in previous feasibility studies and detailed designs, including catchment data, design storms, and runoff coefficients.

ii) Update rainfall–runoff models and undertake advanced hydrological analyses, including Probable Maximum Precipitation (PMP) and Probable

Maximum Flood (PMF) estimation, sensitivity tests, and flood-routing simulations for alternative operating scenarios.

iii) Assess sediment-yield characteristics, sedimentation rates, and reservoir-sustainability implications, and propose feasible sediment-management strategies.

iv) Collaborate closely with the Dam Safety Engineer to define Inflow Design Floods (IDF), confirm spillway sizing, and refine reservoir-operation and flood-management rules.

v) Provide hydrological inputs for the Dam Safety Plan and contribute to Emergency Action Plan (EAP) preparation, including flood-routing and inundation-mapping inputs.

vi) Prepare all hydrology-related sections of the Design Review Reports, Construction Supervision Reports, and other technical deliverables required under the assignment.

5.5 Dam Safety Engineer

a) **Role**

The Dam Safety Engineer will provide specialized technical oversight to ensure that all aspects of the design review, construction supervision, and early-operation phases comply with international dam-safety requirements. The Engineer will ensure alignment with ICOLD standards, the World Bank's ESS4 (Community Health and Safety), OP 4.37 principles, and national dam-safety regulations. He/she will guide failure-mode assessment, instrumentation planning, construction-stage monitoring, and emergency-preparedness arrangements to ensure the long-term safety and resilience of the Kidete and Kimagai Dams.

b) **Qualifications**

The Dam Safety Engineer shall be a Civil, Structural, or Hydraulic Engineer with:

i) A recognised university degree in a relevant engineering discipline (a Master's degree in dam or geotechnical engineering is an advantage).

ii) A minimum of twelve (12) years of professional experience directly related to dam safety.

iii) Substantial experience in dam-safety assessment, dam instrumentation design and interpretation, and safety-monitoring systems for earth fill, rockfill, and/or concrete dams.

iv) Proven involvement in at least two (2) assignments for large dams that included dam-safety review, Potential Failure Modes Analysis (PFMA) or equivalent risk assessment, and preparation and/or updating of Emergency Action Plans (EAPs), including dam-break and inundation modelling.

v) Experience in construction supervision and/or rehabilitation of dams, including review of construction methods, quality assurance and quality control (QA/QC), and acceptance-of-works procedures.

Note: Assignments limited to generic hydraulic structures or small dams without a substantive dam-safety component will not be considered adequate for this position.

c) Main Responsibilities

i) Review dam-safety design criteria, hazard classification, stability analyses, PFMA results, and proposed mitigation measures to ensure compliance with international and national standards.

ii) Evaluate and verify the adequacy of dam-safety monitoring systems, including instrumentation layout, specifications, installation procedures, calibration, and interpretation methodologies.

iii) Supervise and provide guidance on instrumentation installation and monitoring during construction, first impoundment, and early operation.

iv) Lead or contribute to the preparation and validation of the Dam Safety Plan, Instrumentation & Monitoring Plan, Construction Supervision & Quality Assurance Plan (CSQAP), and Emergency Action Plan (EAP), including dam-break and inundation analysis.

v) Advise on safety protocols, inspection schedules, impoundment procedures, and periodic dam-safety audits.

vi) Support construction supervision by reviewing construction methods, material quality, adherence to safety requirements, and compliance with approved designs.

vii) Provide training, mentoring, and capacity building for NIRC staff on dam-safety management, instrumentation interpretation, emergency preparedness, and long-term safety monitoring.

5.6 Quantity Surveyor

a) Role

Responsible for the preparation, verification, and review of cost estimates, Bills of Quantities (BoQs), payment certificates, and variation orders to ensure value for money and cost control during design and supervision stages.

b) Qualifications

i) Bachelor's degree in Quantity Surveying, Construction Economics, or equivalent field.

ii) Registered Quantity Surveyor with at least 7 years of professional experience in infrastructure or dam projects.

iii) Demonstrated competence in FIDIC-based contracts and cost management of donor-funded works.

c) Main Responsibilities

i) Review and validate quantities and cost estimates prepared during design and tender documentation stages.

ii) Prepare detailed cost breakdowns and assist in the preparation of bidding documents and evaluation of tenders.

iii) Evaluate and verify contractor's payment applications, variation orders, and claims.

iv) Maintain updated cost control and financial monitoring records.

v) Provide input to progress reports, financial summaries, and final accounts.

5.7 Land Surveyor

a) Role

Provide accurate and comprehensive survey data to support the design and construction of irrigation and dam works. Ensure that all topographical and mapping information meets the precision requirements of large-scale water infrastructure projects.

b) Qualifications

i) Bachelor of Science (BSc) in Land Surveying or a closely related field.

ii) **Minimum 7 years** of overall professional experience, including at least **5 years in GIS and digital thematic mapping** for large irrigation or dam projects.

iii) Demonstrated expertise in **topographical land surveys** and preparation of high-accuracy survey maps.

iv) Proficiency in the use of **LIDAR technology, GIS-based survey methods, and related digital mapping tools**.

c) Main Responsibilities

i) Conduct all required topographical, cadastral, and control surveys for design and construction purposes.

ii) Carry out joint survey works with the contractor, ensuring consistency and accuracy of reference points, benchmarks, and setting-out data.

iii) Prepare and deliver digital base maps, drawings, and georeferenced data sets suitable for design, tendering, and construction supervision.

iv) Maintain precise survey records and ensure seamless data transfer to design, geotechnical, and construction teams.

v) Provide technical advice on survey-related issues encountered during construction, including verification of as-built works.

vi) Perform any other survey tasks assigned or delegated by the Team Leader to meet project objectives.

5.8 Geotechnical Engineer

a) Role

Lead and review all geotechnical investigations required for the planning, design, and construction of large dams and associated irrigation works. Provide expert technical advice on soil and rock conditions, foundation treatment, and geotechnical safety.

b) Qualifications

i) Bachelor’s degree in Geotechnical Engineering, Geological Engineering, or a closely related discipline.

ii) **Minimum 7 years** of overall professional experience, including at least **4 years in geotechnical investigations for large dams**, covering surface exploration, geophysical and sub-surface investigations.

iii) Proven experience in geotechnical analysis, including foundation stability assessments, seepage analysis, and other safety-critical evaluations relevant to dam and command area projects.

c) Main Responsibilities

i) Plan, conduct, and review all geotechnical investigations, including drilling, sampling, in-situ and laboratory testing, and geophysical surveys.

ii) Evaluate subsurface conditions and provide recommendations on foundation preparation, slope stability, seepage control, and erosion protection.

iii) Prepare or review geotechnical design parameters and ensure their proper integration into engineering designs and construction specifications.

iv) Support the Team Leader in risk assessments and hazard analyses, providing timely advice on remedial measures when unexpected ground conditions are encountered.

v) Maintain complete and accurate geotechnical records, including field logs, laboratory test data, and interpretive reports.

i) Undertake any additional geotechnical tasks or activities assigned or delegated by the Team Leader to meet project objectives.

5.9 Sociologist

a) Role

Lead all **social assessments and community engagement activities** to ensure that project planning, design, and implementation are socially inclusive and responsive to local needs. Facilitate effective participation of affected communities and stakeholders throughout the project cycle.

b) Qualifications

i) Bachelor’s degree in Sociology or a closely related field.

ii) **Minimum 5 years** of professional experience in participatory planning, social impact assessment, and stakeholder consultation, preferably in irrigation or agro-water development contexts.

iii) Proficiency in **Kiswahili** and strong knowledge of **local institutional and social structures**.

c) Main Responsibilities

i) Design and implement community consultation programs, ensuring meaningful participation of farmers, local leaders, and other stakeholders.

ii) Assess potential social impacts, risks, and opportunities, and recommend measures for equitable benefit-sharing and conflict resolution.

iii) Ensure gender equity and social inclusion are incorporated in project planning and implementation.

iv) Facilitate communication between the project team and local communities, integrating stakeholder feedback into technical and management decisions.

v) Document consultations and prepare concise social assessment and progress reports.

vi) Undertake any other social or community-related tasks assigned or delegated by the Team Leader to meet project objectives.

5.10 Procurement Specialist

a) Role

Manage all **procurement and contract administration activities** for the project, ensuring that every procurement action is compliant with Tanzanian regulations and World Bank requirements. Provide expert guidance throughout the tendering, evaluation, and contract-management process.

b) Qualifications

i) Bachelor's degree in Procurement, Supply Chain Management, or a related field.

ii) **Minimum 5 years** of professional experience in project procurement and contract management, preferably in large infrastructure or water sector projects.

iii) In-depth knowledge of **local institutional frameworks** and strong familiarity with **Tanzanian public procurement regulations**.

iv) Proficiency in **Kiswahili** and excellent working knowledge of English.

c) Main Responsibilities

i) Coordinate and support all procurement inputs required to deliver the consultancy outputs, including preparation of procurement plans and schedules related to project designs and works packages.

ii) Assist in the preparation and review of bidding documents and evaluation criteria for works and services designed under the assignment, ensuring that documents conform to World Bank and national procurement standards.

iii) Provide technical guidance and input during tendering and bid evaluation processes.

iv) Advise the Team Leader and other team members on procurement risks, compliance requirements, and contract management implications, ensuring that procurement aspects are fully integrated in feasibility studies, detailed designs, and implementation plans.

v) Contribute to progress reports and final deliverables, summarizing procurement issues, lessons learned, and recommended improvements.

vi) Carry out any other procurement-related tasks assigned or delegated by the Team Leader to help achieve the consultancy's objectives and outputs.

5.11 Safeguard Specialist

a) Role

Ensure that all activities carried out under the consultancy **comply with environmental and social safeguard requirements**. Lead the development, implementation, and continuous improvement of safeguard procedures, ensuring full alignment with Tanzanian regulations and the World Bank's Environmental and Social Standards (ESS), particularly ESS1 (Assessment and Management of Environmental and Social Risks and Impacts) and ESS4 (Community Health and Safety).

b) Qualifications

i) Bachelor's degree in Environmental Management, Environmental Engineering, Social Sciences, or a closely related field.

ii) **Minimum 5 years** of professional experience in implementing and monitoring environmental and social safeguards for infrastructure projects, preferably in water resources, irrigation, or dam-related works.

iii) Proven familiarity with **national environmental and social regulations** and World Bank safeguard policies and procedures.

c) Main Responsibilities

i) Integrate environmental and social considerations into all phases of the consultancy, from feasibility and design through construction supervision.

ii) Prepare, implement, and regularly update the consultancy's safeguard policies and procedures, ensuring they remain current with national laws and World Bank ESS requirements.

iii) Conduct and/or review environmental and social impact assessments (ESIAs) and ensure that all required mitigation and monitoring measures are incorporated in project designs and contract documents.

iv) Develop and monitor Environmental and Social Management Plans (ESMPs) and other safeguard instruments relevant to dam and irrigation projects.

v) Provide training, guidance, and technical support to the consultancy team and contractors on compliance with safeguard measures, including occupational health and safety and community engagement.

vi) Prepare and submit environmental and social safeguard reports for inclusion in progress, interim, and final consultancy deliverables.

vii) Identify and advise on environmental and social risks, propose corrective actions, and monitor their timely implementation.

viii) Carry out any additional safeguard-related tasks assigned or delegated by the Team Leader to ensure that all consultancy outputs meet World Bank and national requirements.

5.12 Supporting Staff

The Consultant shall deploy support and back-up personnel such as survey assistants, CAD/GIS technicians, materials technicians, and administrative staff as needed to ensure the smooth and timely completion of all tasks. While the CVs of these supporting staff will not be scored during proposal evaluation, they must be adequate in number, skills, and experience to effectively assist the key experts and to maintain the required standards of quality and efficiency.

The Consultant is responsible for determining the exact composition and duration of these positions, taking into account the specific needs of each project phase and the overall assignment. The staffing plan should demonstrate that the proposed support resources are sufficient to deliver all outputs efficiently and on schedule.

6.0 ESTIMATED STAFF MONTHS

The Consultant shall mobilize a qualified, multi-disciplinary team for the **Feasibility and Detailed Design**, **Tendering**, **Construction Supervision**, and **Defect Liability Period**.
The following revised estimate reflects the recommended increases in geotechnical and procurement effort and includes a modest contingency for construction supervision to ensure adequate coverage under potential schedule variations.

6.1 Phase I – Feasibility Study and Detailed Design

Planned duration: **five (5) months**

SN	Team Member	Number Required	Period (Man-month)	Total Man-months
1	Team Leader (TL)	1	2	2
2	Civil / Irrigation / Agro Engineers	2	5	10
3	Hydrologist	1	3	3
4	Quantity Surveyor	1	2	2
5	Dam Safety Engineer	1	2	2
6	Land Surveyor	2	2	4
7	Geotechnical Engineer	1	3	3
8	Sociologist	1	2	2
Total Man-months				**28**

6.2 Phase II – Tendering Process

Planned duration: **about four (4) months**

SN	Team Member	Number Required	Period (Man-month)	Total Man-months
1	Civil / Irrigation / Agro Engineer	1	2	2
2	Hydrologist	1	0.5	0.5
3	Quantity Surveyor	1	0.5	0.5
4	Procurement Specialist	1	**1.5**	**1.5**
Total Man-months				**4.5**

6.3 Phase III – Construction Supervision

Assumed construction period: **approximately 18 months**, with provision for schedule variability.

SN	Team Member	Number Required	Period (Man-month)	Total Man-months
1	Team Leader (TL)	1	5	5
2	Civil / Irrigation / Agro Engineers	2	18	36
3	Hydrologist	1	4.5	4.5
4	Quantity Surveyor	1	4.5	4.5
5	Dam Safety Engineer	1	6	6
6	Land Surveyor	1	9	9
7	Safeguard Specialist	1	3	3
Total Man-months				**68.0**

6.4 Phase IV – Defect Liability Period

Planned duration: **12 months**

SN	Team Member	Number Required	Period (Man-month)	Total Man-months
1	Civil / Irrigation / Agro Engineer	1	2	2
2	Dam Safety Engineer	1	1	1
3	Land Surveyor	1	1	1
Total Man-months				**4**

Summary of Staff Inputs

Phase	Total Man-months
I – Feasibility & Design	**28**
II – Tendering	**4.5**
III – Construction Supervision	**68**
IV – Defect Liability	**4**
Grand Total	**≈104.5 man-months (rounded to 112)**

7.0 PAYMENT SCHEDULE

Payments to the Consultant shall be made against approved deliverables and invoices, strictly following the agreed time-based and deliverable-based arrangements. All prices shall be quoted exclusive of taxes, which will be handled in accordance with Tanzanian tax laws and the contract provisions.

7.1 Phase I – Feasibility Study and Detailed Design (30 % of Total Contract Value)

Output / Deliverable	% of Phase I value	% of Total Contract Value	Payment Condition
Inception Report	20 %	6 %	Submission and approval of the Inception Report.
Capacity Building & Training – Stage 1	8 %	2.4 %	Approved training plan and delivery of agreed Stage 1 training modules, with training report and attendance records.
Interim Report	20 %	6 %	Submission and approval of the Interim Report.
Draft Final Report	22 %	6.6 %	Submission and approval of the Draft Final Report.
Final Report and Bidding Documents	30 %	9 %	Submission and approval of the Final Report and complete Bidding Documents.

Total for Phase I = 30 % of the total contract value

7.2 Phase II – Construction Supervision (65 % of Total Contract Value)

Output / Deliverable	% of Phase II value	% of Total Contract Value	Payment Condition
Monthly Supervision Payments (progressive)	80 %	52 %	Time-based payments for verified supervision services, supported by approved timesheets and progress reports.
Capacity Building & Training – Stage 2	10 %	6.5 %	Delivery of on-site and workshop training (O&M, emergency preparedness, environmental & social safeguards) and submission of final training completion report.

Output / Deliverable	% of Phase II value	% of Total Contract Value	Payment Condition
Retention	10 %	6.5 %	Released upon approval of As-Built Drawings and the Supervision Completion Report.

Total for Phase II = 65 % of the total contract value

7.3 Phase III – Defects Liability Period (5 % of Total Contract Value)

Output / Deliverable	% of Phase III value	% of Total Contract Value	Payment Condition
Final Inspection and Defects Liability Completion Report	100 %	5 %	Payment after final inspection and approval of the Defects Liability Completion Report.

7.4 General Conditions of Payment

i) Payments shall only be made upon the Client's written acceptance of deliverables and reports, and where applicable, certification by the Client's Project Implementation Team (PIT).

ii) All interim payments shall be treated as advances subject to adjustment against the final statement of accounts.

iii) In case of delays or deficiencies in performance, the Client reserves the right to withhold payments until remedial measures are undertaken to its satisfaction.

7.5 Tax Note

The Consultant's quoted prices and financial offers shall be inclusive of all applicable taxes (including VAT and withholding tax). All such taxes shall be administered and paid in accordance with Tanzanian tax legislation and the contract conditions, ensuring full compliance with government requirements and World Bank financing agreements.

7.6 Reimbursable Expenses

In addition to professional fees, the Consultant shall be reimbursed for eligible project-related expenses, including but not limited to travel, accommodation, per diem, laboratory testing, survey equipment hire, topographic and geotechnical investigations, printing, and communications. Such expenses shall be paid **at cost**, upon submission of itemized statements with supporting receipts, and shall not exceed the reimbursable cost ceiling specified in the contract. Reimbursable

payments shall be made concurrently with the relevant monthly or quarterly payment certificates.

7.7 Payment Curve (Summary Table)

Phase / Deliverable	% of Phase Value	% of Contract Value	Cumulative %
Phase I – Feasibility Study & Detailed Design (30 %)			
Inception Report (approved)	20 %	6 %	6 %
Interim Report (approved)	20 %	6 %	12 %
Capacity Building & Training – Stage 1 (approved)	8 %	2.4 %	14.4 %
Draft Final Report (approved)	22 %	6.6 %	21 %
Final Report & Bidding Documents (approved)	30 %	9 %	30 %
Phase II – Construction Supervision (65 %)			
Monthly / Quarterly Supervision Payments (progressive, time-based)	80 %	52 %	82 %
Capacity Building & Training – Stage 2 (approved)	10 %	6.5 %	88.5 %
Retention (released after As-Built Drawings & Supervision Completion Report)	10 %	6.5 %	95 %
Phase III – Defects Liability Period (5 %)			
Final Completion Report & Certification of Rectified Defects	100 %	5 %	100 %

8.0 CLIENT'S OBLIGATIONS

To ensure smooth and effective implementation of the assignment, the National Irrigation Commission (NIRC), acting through the Project/Contract Implementation Team, shall provide the following support to the Consultant:

8.1 Timely provision of data and approvals

To enable the Consultant to perform the Services in accordance with the agreed work plan and schedule, the Client shall:

- Provide to the Consultant, within fourteen (14) calendar days of contract signature (or of a written request from the Consultant, as applicable), all existing reports, studies, designs, survey data, hydrological and

meteorological data, maps and other relevant documentation that are reasonably required for the Services and are in the Client's possession; and

- Review and provide written comments and/or approval on all reports and other deliverables submitted by the Consultant within thirty (30) calendar days of receipt, unless a different period is expressly agreed in writing for a specific deliverable.

If the provision of key data or the review and approval of deliverables is delayed beyond these timeframes for reasons not attributable to the Consultant, the Consultant shall notify the Client in writing, and the Parties shall agree appropriate adjustments to the work schedule (and, where justified, to the time for completion) to reflect such delays, without prejudice to the agreed remuneration rates.

8.2 Data, Reports, and Information

a) Provide the Consultant with all relevant project information and data in its custody, including feasibility studies, preliminary and detailed designs, environmental and social assessments, hydrological data, survey maps, cadastral records, institutional plans, and other technical reports essential for the assignment.

b) Keep the Consultant informed of the progress of any related or parallel studies to ensure effective coordination and information exchange.

c) Facilitate access to archives, government offices, and other public agencies holding supplementary data or records needed to carry out the assignment.

8.3 Access, Permissions, and Liaison

a) Secure permits and permissions necessary for entry into project sites and other areas required for the proper execution of the assignment.

b) Facilitate official introductions and liaison with relevant government agencies, riparian authorities, and other institutions both within Tanzania and, where applicable, in neighbouring countries involved in water-resource notifications so that the Consultant can collect additional information at their own cost.

8.4 Stakeholder Coordination and Meetings

a) Arrange and facilitate consultative meetings, workshops, and stakeholder engagements with regional, district, and community leaders to ensure broad participation and effective information flow.

b) Assist in maintaining linkages with regional and local authorities and other institutions essential for the assignment.

8.5 Counterpart Staff and Capacity Building

a) Nominate and assign qualified counterpart technical staff covering dam engineering, irrigation, agronomy, sociology, environmental management, and land surveying to work alongside the Consultant, ensuring effective on-the-job capacity building and technology transfer.

b) Facilitate the participation of counterpart staff in all agreed training sessions, workshops, field visits, and review meetings to strengthen institutional capacity.

8.6 Approvals and Administrative Support

a) Review and approve Consultant deliverables such as reports, designs, and bidding documents within the agreed timeframes.

b) Facilitate visas, work permits, security clearances, and letters of introduction to regional and district authorities as needed for local and international experts.

c) Provide official correspondence and communication support for government-to-government engagement.

d) Facilitation of stakeholder engagement and public consultations, including invitation of local leaders and community representatives.

8.7 Financial and Contractual Support

a) Process the Consultant's invoices and payments promptly in accordance with the contract.

b) Reimburse eligible expenses defined in the contract upon submission of appropriate supporting documentation.

9.0 CONSULTANT'S OBLIGATIONS

The Consultant shall execute the assignment with the highest professional and technical standards, in full compliance with the contract, Tanzanian laws and regulations, and internationally accepted dam engineering and safety practices (including ICOLD guidelines and the World Bank Environmental and Social Framework). The Consultant is fully responsible for the quality, timeliness, and integrity of all services and deliverables.

9.1 General Responsibilities

a) Carry out the feasibility study, detailed engineering design, and cost estimates described in these Terms of Reference diligently and within the agreed timeframes, using qualified and appropriate staff and methods consistent with international best practice.

b) Mobilize and maintain a multidisciplinary team of key experts and support staff as agreed in the staffing schedule, and submit full curricula vitae for each team member in the prescribed format at mobilization.

c) Replace any team member who is unable to perform or is found unsuitable with another of equivalent qualifications and experience, subject to the Employer's prior written approval.

d) Engage additional short-term experts if necessary to ensure successful completion of the assignment at no extra cost to the Client.

e) Work closely with the Client's designated counterpart staff to promote on-the-job capacity building and technology transfer.

9.2 Technical and Professional Obligations

a) Undertake and/or verify all required topographic, cadastral, geotechnical, and hydrological surveys as an integral part of the design process.

b) Prepare and submit all reports, drawings, specifications, and bidding documents in the formats and timelines specified in these ToR.

c) Provide professional supervision, contract administration, and quality assurance to safeguard dam safety, structural integrity, and environmental and social compliance.

d) Certify the contractor's works, materials, and progress in accordance with approved designs and specifications, and review and approve as-built drawings prepared by the contractor.

e) Prepare and submit a complete set of tender/bidding documents in both hard copy and digital format, ready for procurement purposes.

f) Maintain comprehensive and well-indexed records of all correspondence, instructions, approvals, survey data, calculations, and site activities throughout the assignment.

9.3 Logistical and Operational Obligations

a) Establish and maintain site offices, equipment, transport, and communication facilities required for the services.

b) Provide all working tools, software, IT equipment, and laboratory services necessary for design review, construction supervision, and reporting.

c) Cover all costs related to consultant staff including accommodation, transport, insurance, per diems, and security without recourse to the Client, except as specified for reimbursables.

d) Arrange or subcontract accredited laboratories for material testing when required, with the Employer's prior approval.

e) At the end of the contract, hand over to the National Irrigation Commission (NIRC) all procured equipment and complete records of work, including reports, drawings, data sets, and digital files.

9.4 Safeguards and Safety Obligations

a) Implement environmental and social monitoring in accordance with the Environmental and Social Management Plan (ESMP) and World Bank safeguard requirements.

b) Ensure strict compliance with occupational health and safety (OHS) standards for consultant and contractor staff.

c) Support stakeholder engagement and community consultations, including facilitation of an effective grievance redress mechanism.

d) Provide periodic safeguards and safety compliance reports to the Employer.

9.5 Knowledge Transfer and Counterpart Involvement

a) Attach NIRC counterpart staff to consultant teams for on-the-job mentoring throughout the assignment, and conduct at least two structured training workshops, one during the design review stage and another during construction supervision.

b) Document and consolidate all capacity-building activities in a comprehensive Final Capacity Building Report.

9.6 Counterpart Staff Involvement and Provisional Sum

a) Counterpart staff engagement and capacity-building plan

In order to maximise capacity building and knowledge transfer, the Consultant shall, within the Inception Report, prepare a brief Counterpart Staff Engagement and Capacity-Building Plan up to **seven (7) NIRC counterpart staff** assigned to the project for on-the-job training and technology transfer. These counterparts will participate in both field activities and the Consultant's home-office work as required.. The Plan shall:

- Identify the counterpart staff to be assigned by the Client (functions, background and expected availability);

- Describe how these counterparts will be integrated into the work programme, including their participation in key tasks such as field investigations, design reviews, hydrological and dam-safety analyses, construction supervision and first impoundment;
- Set out the specific on-the-job training and formal training activities (workshops, seminars, mentoring, site-based demonstrations, etc.) to be provided, with indicative timing, duration and responsibilities; and
- Indicate how the counterpart engagement is linked to the capacity-building outputs specified in this Terms of Reference (e.g. training sessions, manuals, guidelines, standard operating procedures).

Progress in implementing the Counterpart Staff Engagement and Capacity-Building Plan shall be summarised in the Consultant's periodic progress reports and reflected in the final handover and capacity-building report.

b) Provisional Sum for counterpart staff costs

*A **Provisional Sum** of TZS [**150,000,000**] (or such other amount as specified in the Contract Data Sheet) is included in the Contract Price to cover the **per diems, local transport and accommodation costs** of counterpart staff designated by the Client to work with the Consultant.*

c) Applicable rates and rules

*Expenditures under this Provisional Sum shall be paid on the basis of **actual costs incurred**, in accordance with the applicable **Government of Tanzania / NIRC rates and regulations** for per diems, travel and accommodation, as communicated in writing by the Client at the start of the assignment.*

d) Documentation requirements

*All payments from this Provisional Sum shall be supported by appropriate documentation (e.g. approved travel authorisations, attendance lists, hotel invoices, transport receipts or equivalent evidence), in a form acceptable to the Client. The Consultant shall maintain a separate **Provisional Sum ledger** and include a brief summary of expenditures under this item in the periodic financial/progress reports.*

e) Unspent balance

*The Provisional Sum is provided **solely for the benefit of the Client's counterpart staff**. Any **unspent balance** of this Provisional Sum at the end of the assignment shall **remain with the Client** and shall **not be payable** to the Consultant or reallocated to fees or other cost items, unless otherwise agreed in writing by the Client and the World Bank (or relevant financier).*

9.7 Contractual Integrity

a) Do not assign or subcontract any part of the professional engineering services without the prior written consent of NIRC.

b) Ensure independence and impartiality in reviewing designs and supervising works, and avoid any conflict of interest with contractors, suppliers, or other stakeholders.

10.0 Coordination and Institutional Arrangements

The Consultant shall operate under the overall authority of the National Irrigation Commission (NIRC), which is the Employer for this assignment. Institutional arrangements shall ensure efficient decision-making, proper flow of information, and compliance with contract requirements.

10.1 Reporting Lines

a) **Primary Reporting:** The Consultant's Team Leader shall report directly to the Project Manager (PM) appointed by the National Irrigation Commission (NIRC) for Component B of TIRP-2. The PM will be the immediate authority for technical direction, contract administration, and verification of progress.

b) **Decision-Making:** The PM shall make all major technical and contractual decisions after consultation with the Project Coordinator (PC) to ensure alignment with overall project objectives and integration with other components.

c) **Coordination and Upward Reporting:** The PC shall provide overall coordination on behalf of the Employer, facilitate inter-agency linkages, support timely approvals, and report to the Director General (DG) of NIRC on all matters relating to Component B and its integration with the broader TIRP-2 framework.

d) **Strategic Oversight:** The Director General (DG) of NIRC shall provide strategic oversight and report to the Project Steering Committee established under TIRP-2.

10.2 Interaction with the Works Contractor

a) The Consultant shall act as the Engineer/Employer's Representative under the works contract, to the extent of authority delegated by the Employer.

b) All contractual instructions to the Contractor shall be issued through the Consultant, unless otherwise directed by the Employer.

c) The Consultant shall ensure that all site instructions, approvals, and certifications are documented and communicated promptly to both the Employer and Contractor.

10.3 Stakeholder Coordination

The Consultant shall support the Employer in coordinating with:

a) Tanzania Railways Corporation (TRC): for protection of railway infrastructure downstream.

b) TANROADS and TARURA: for road infrastructure affected by flood control and access works.

c) Local Government Authorities (LGAs): for community engagement, land access, and local support.

d) Ministry of Water (Dam Safety Unit): for technical oversight and compliance with national dam safety regulations.

e) World Bank Task Team: for review, no-objection, and monitoring missions.

f) Approval process with the Ministry of Water Dam Safety Unit

The Consultant shall support the Employer in obtaining the necessary reviews and clearances from the **Ministry of Water's Dam Safety Unit**. In particular, the Consultant shall:

- **Identify and prepare key submissions** for dam-safety review, including as a minimum: (i) Phase I hydrological, hydraulic and dam-break/inundation studies; (ii) geotechnical and structural design reports; (iii) PFMA or equivalent risk assessment and risk register; (iv) draft and final designs and drawings; (v) draft Emergency Action Plans (EAP) with inundation maps; and (vi) draft Operation and Maintenance (O&M) manuals and instrumentation/monitoring plans.

- Agree with the Employer and the Dam Safety Unit on **review milestones** and an indicative review schedule (e.g. submissions at end of Phase I design review, prior to tendering, prior to first impoundment), and reflect these milestones in the overall project programme.

- **Submit** the required documentation to the Dam Safety Unit in a timely manner and provide clarifications or supplementary information as requested.

- **Document and respond** in writing to comments and requirements from the Dam Safety Unit, including, where justified, additional analyses or design refinements.

- **Integrate the agreed dam-safety requirements** and recommendations of the Dam Safety Unit into the final designs, EAP and O&M manuals, and clearly record in the Phase I/Final Design Reports how these comments have been addressed.

The Consultant shall include in its periodic progress reports a brief summary of the **status of submissions and approvals** with the Dam Safety Unit and any implications for design, construction or first impoundment scheduling.

10.4 Project Meetings

a) Kick-off Meeting: within two weeks of contract signing to agree on work plan, reporting schedules, and coordination protocols.

b) Monthly Site Meetings: led by the Consultant, with attendance by the Employer, Contractor, and key stakeholders.

c) Quarterly Progress Review Meetings: chaired by NIRC (DG or delegated authority) with participation of stakeholders and the World Bank, as required.

d) Ad-hoc Technical Meetings: as needed to address design, contractual, or safeguard issues.

10.5 Communication Protocols

a) All official communication shall be in writing (letters, emails, or memos).

b) Copies of all key correspondence between the Consultant and the Contractor shall be shared with the Employer.

c) Reports and technical submissions shall be provided in both electronic and hard copy formats.

11.0 Evaluation and Selection Criteria

The selection of the Consultant shall follow the **World Bank Procurement Regulations for IPF Borrowers (Sixth Edition, February 2025)**, using the **Quality and Cost Based Selection (QCBS)** method. Proposals will be evaluated against both technical and financial criteria.
In view of the high dam-safety risks and the requirements of OP 4.37 / ESS4, particular emphasis shall be placed on the Consultant's experience and approach in dam safety, Potential Failure Modes Analysis (PFMA), Emergency Action Plans (EAP) including dam-break and inundation modelling, climate-resilient design and sediment management / reservoir sustainability. The technical evaluation sub-criteria shall therefore explicitly reward proven experience and robust methodologies in these areas.

11.1 Technical Evaluation Criteria (80 points)

a) **Specific Experience of the Firm (16 points)**

i) Experience in dam rehabilitation / new dam design and construction supervision – **8 points**

ii) Specific experience in dam-safety assignments for large dams, including PFMA, EAP preparation with dam-break and inundation modelling, and reservoir sediment-management / sustainability studies – **8 points**

Note: To obtain full points under this sub-criterion, the Consultant shall demonstrate at least two (2) assignments for large dams where PFMA and/or similar risk assessment, EAP including dam-break analysis, and sediment-management planning were core components.

b) **Adequacy of Proposed Methodology and Work Plan (24 points)**

i) General understanding of the ToR, proposed work plan, organisation and staffing – **12 points**

ii) Soundness of the proposed approach to dam safety, PFMA, EAP including dam-break and inundation modelling, climate-change / climate-resilience analysis, and sediment-management / reservoir-sustainability – **12 points**

This sub-criterion will assess, inter alia, whether the Consultant proposes robust methods for: (i) identification and assessment of potential failure modes; (ii) hydrological and hydraulic modelling, including dam-break and inundation analysis; (iii) climate-stress testing of design floods, reservoir yields and spillway capacity; and (iv) long-term sediment management and reservoir sustainability.

c) **Qualifications and Competence of Key Experts (40 points)**

i) Team Leader – experience on large dam and water-resources projects, including construction supervision – **12 points**

ii) Dam Safety Engineer – experience in dam-safety assessment, PFMA, instrumentation, EAP and dam-break / inundation analysis for large dams – **12 points**

iii) Hydrologist – experience in design-flood estimation, hydrological modelling for dams, climate-change analysis and support to dam-break studies – **8 points**

iv) Geotechnical Engineer – experience in dam foundations, embankment stability and seepage control – **4 points**

v) Safeguards / Environmental & Social Specialist – experience in dam-related ESIA/ESMP, emergency-preparedness and community-safety issues – **4 points**

11.2 Financial Evaluation Criteria (20 points)

i) Financial proposals will be evaluated based on compliance with the RFP requirements, completeness, and competitiveness.

ii) The lowest evaluated financial proposal will receive the maximum score, with others scored proportionally.

11.3 Final Ranking

i) The final ranking will be based on a weighted score of **80%** Technical and **20%** Financial.

ii) The highest-ranked Consultant will be invited for negotiations and contract award.

12.0 Expected Outputs and Final Deliverables

At the conclusion of the assignment, the Consultant shall deliver to the Employer the following outputs, consolidating all work undertaken across the phases of the consultancy:

12.1 Design Review and Validation Outputs

a) Final Reviewed Design Report for Kidete and Kimagai Dams, including:

   i) Updated hydrological, hydraulic, geotechnical, and topographic assessments.

   ii) Verified and updated detailed designs, drawings, specifications, and BoQs.

   iii) Final construction cost estimates and implementation schedule.

b) Final Bidding Documents in World Bank Standard Procurement Document format.

12.2 Construction Supervision Outputs

a) Supervision inception report with approved contractor’s work program and QA/QC plan.

b) Monthly and quarterly supervision reports, including safeguards monitoring.

c) Variation, claims, and risk management reports (as required).

d) Construction Completion Report, including:

    i) Summary of works executed.

    ii) Quality control results and compliance certifications.

    iii) “As-built” drawings.

    iv) Revised O&M manual prepared with the contractor.

12.3 Defects Liability Period Outputs

a) Defects and Maintenance Schedule prepared at the start of the DLP.

b) Periodic DLP Inspection Reports (minimum three during the period).

c) Final Defects Liability Report and Acceptance Certificate confirming all rectifications.

12.4 Capacity Building Outputs

a) Capacity Building Plan (delivered with the inception report).

b) Reports on structured training workshops and on-the-job mentoring.

c) Final Capacity Building Report documenting knowledge transfer achieved.

12.5 Final Consolidated Handover Package

At project closure, the Consultant shall hand over a fully organized and indexed package consisting of:

a) All reports (inception, periodic, completion, safeguards).

b) Final designs, drawings, BoQs, specifications, and cost estimates.

c) “As-built” drawings certified by the Consultant.

d) Operation and Maintenance Manual.

e) Digital archive of all documents (Word, Excel, AutoCAD, GIS, and PDF formats).

Digital archive structure and index

In addition to the individual reports, drawings and datasets described above, the Consultant shall deliver a complete digital archive of all project documentation on external hard drive(s) and/or other agreed media. The archive shall:

- Be organised using a clear and logical folder hierarchy, structured at a minimum by dam (e.g. Kidete, Kimagai) and by phase (e.g. Phase I – Design Review and Detailed Design; Phase II – Tendering; Phase III – Construction Supervision; Phase IV – DLP and Handover);
- Use standardised file-naming conventions that clearly indicate, as appropriate, the dam name, document type, version number and date (for example: Kidete_PhaseI_HydrologyReport_v02_2027-03-15.pdf);
- Include a master index (for example an Excel register) listing all files in the archive, with at least the following fields: file name, title/description, dam, phase, document type (report, drawing, model, dataset, correspondence, etc.), version, date, and any relevant remarks; and
- Clearly identify the final approved versions of all reports, drawings, models and key datasets, and distinguish them from working or draft versions.

The digital archive shall be prepared in a manner that facilitates its direct use by NIRC, the Ministry of Water Dam Safety Unit, the World Bank and other authorised stakeholders for future operation, maintenance, monitoring and dam-safety reviews.