



Ghiring Rural Municipality
Office of the Rural Municipal Executive
Pokharichhap, Tanahun Gandaki
Province, Nepal

Terms of Reference (ToR)
For
Consulting Service on
DPR Preparation for Construction of a Dam
and Initial Environment Examination (IEE)
in Ghumaune Tal

1. Background

Ghiring rural municipality in Tanahun district, Gandaki Province, is created by combining previous 5 VDCs namely Gajarkot, Sabhung Bhagawotipur, Ghiring Sundhara, Ramjakot and Majhkot. The rural municipality, with an area of 126 sq.km. and population of 19,318 (census 2011), is located at an altitudinal extent between 300m to 1000m.

The rural municipality aspires to promote tourism by constructing an artificial lake (Ghumaune Tal) that could help bring together the development opportunities of the entire rural municipality. The Ghumaune Tal is presumed to be a new and novel tourism product for the Ghiring rural municipality and a source of unique attraction for tourists, both domestic and foreign. The idea is to create a lake by impounding the waters of the through the construction of a dam that would also use for irrigation purposes.

The rural municipality therefore seeks a team of consultants to prepare the DPR of the proposed lake (Ghumaune Tal) with geotechnical and initial environmental examination. The DPR will be augmented with a comprehensive tourism development and management plan. The consultants will also provide inputs for the spatial planning of the valley from the perspective of the resident population as well as the tourists.

2. Objectives

2.1 Primary Objective:

To prepare detail project report (DPR) which shall at core be comprised of among others the following things:

- (a) feasibility analysis of the construction of dam (as proposed in the initial pre-feasibility study) with the prospect to irrigate and create a recreational lake in the upstream
- (b) assessment of potential risk and vulnerabilities
- (c) impact analysis of urbanization and tourism development on the natural resources and landscape including proposed lake and dam
- (d) recommendation on the viability of the proposed dam and lake including other viable alternative, and
- (e) blue print (plan) to execute, operate and manage the project.

2.2 Secondary objective:

To conduct Initial Environment Examination (IEE) for following things

- (a) brief evaluation of possible environmental impacts
- (b) analysis and real solutions for the possible environmental impacts

3. Scope of Work

The scope of work shall broadly include two segments. The *first* includes preparation of detail project report (DPR) which comprises of feasibility analysis and execution plan for the construction of dam for recreational lake (Ghumaune Tal), and the *second* includes initial environment examination (IEE) report.

4. Expected Outputs

Firstly, along with the inception report or preferably earlier than its submission, conceptual sketches of the entire project should be submitted by the consulting team. These visualizations

will be critical to orient the stakeholders, and the general public about the scale, intention, and functions of the project. Subsequently, it will help to make all the stakeholders aware about the project thereby clearing any confusions and doubts.

The completed work should contain a complete report consisting of following major outputs:

Output 1: DPR of the proposed dam

The consultants shall prepare detail design and drawings for:

- ✓ Architectural
- ✓ Structural
- ✓ Mechanical
- ✓ Spillway
- ✓ Gate System
- ✓ Irrigation Supply System in downstream
- ✓ Site protection works

Output 2: Initial Environment Examination

The consultants should do detail study on initial environment examination for the construction of artificial lake Ghumaune Tal. The consultants shall provide reports on following headings:

- ✓ Description of project
- ✓ Baseline environmental conditions
- ✓ Potential Impacts and mitigation measures
- ✓ Mitigation and monitoring
- ✓ Conclusion and recommendation

Drawings should include Structural /Working Drawings. Deliverable shall include;

- ✓ Detailed Design, Drawings,
- ✓ Drawings for approval of Rural Municipality
- ✓ Detailed Unit Rate Analysis, Cost Estimates, Work Specifications
- ✓ Complete set of Bidding Documents

5. Methods

5.1 Method for data collection and analysis

A. Construction of Dam

The study shall rely on both primary and secondary data. Primary data includes geological data of the site where dam shall be constructed and lake shall be created. The proven geotechnical method and instrument have to be used to investigate geological conditions and bearing capacities of soil for the construction of dam, and lake. Accordingly, type of dam has to be proposed.

Detail analysis has to be undertaken of rainfall, watershed, runoff, and river/stream water discharge that converges into reservoir and dam as well as to downstream areas. Historical rainfall and flood data have to be referred from the relevant statistics and archives of the national and international agencies and also gathered from the site by interacting with local people from the region. The GIS aided hydraulic analysis has to be also carried out to evaluate the flow characteristics of the existing river/stream system. Information on trend of water-induced hazards and other risks shall be collected through rapid appraisals of the project area,

consultations with the municipality and discussions with the local stakeholders. The relevant computer-based modelling is required for the structure analysis of dam.

All potential input forces both static and dynamic have to be taken into account to ensure the stability of dam and other infrastructures at all conditions. This must be based on accepted standard code of analysis and design applicable to dam and related infrastructures. First-hand information on water demand for various purposes shall be collected by interacting with local citizens in the impact areas.

Also, cadastral maps shall be studied along with field verification and survey to identify areas likely to be submerged by the project as well as to identify the losses of private and public properties and assets. Focused group discussions with the affected landowners have to be undertaken to know their views as well as to exchange project information. Site visits and inspections should be undertaken to collect information on flora and fauna, natural wildlife habitat, and ecologically sensitive areas. This shall be aided by cadastral maps, GIS and satellite images.

B. Initial Environment Examination (IEE)

IEE is conducted to examine the proposed artificial lake (Ghumane Tal) in Ghiring Rural Municipality, ensure that the environmental issues associated with the development are effectively managed and they will not damage the environment, and provide guidance for the planning, construction Ghumaune Tal.

6. Submission of Reports and Presentation of the Works

6.1 Preliminary Design Report

This report shall contain the preliminary design concepts and short descriptions relating to the proposed structure (Dam) and its major components, e.g. Architectural, Structural, Irrigation system, Spillway, Mechanical, Gate system, and Site protection works. It shall include location of proposed foundations of the Dam along with comparison between the possible alternative types and Initial Environment Examination (IEE) report. This report shall be submitted in two copies and the content shall be discussed with Rural Municipality before proceeding to the detailed design of the building. The consultant shall present the Preliminary Design Report to the Rural Municipality audience. The cost of such presentation shall be borne by the Consultants.

6.2 Draft Report

This draft report shall be in standard format, containing all the required components of the design and be presented in clear and easy to refer formats as per the general design guidance attached. The complete set of the report should consist of:

- Volume I - Main Report
- Volume II - Drawings (structural/working)
- Volume III - Design Calculations
- Volume IV - Unit Rate Analysis, Cost Estimates, Bill of Quantity, and Special Provisions to Standard Specifications, if any
- Volume V - Standard Bidding Document
- Appendices
- Initial Environment Examination (IEE) report

This report shall be submitted in two copies.

6.3 Final Report

The Rural Municipality may also discuss upon the technical content of the report and may suggest some changes if thought necessary. While preparing the Final Report the

consultants shall consider the comments/suggestions and make corrections or amendments if required. It does not, however, relieve the consultants of their responsibility over the technical content of the design. The final report shall be submitted in two copies.

6.4 Soft Copy (Electronic Copy) of the Design

Apart from the bound report the consultants shall submit soft copies (Electronic Copies) of the final report in USB as specified.

7. Time Schedule

If not indicated otherwise in the contract documents the consultant shall complete the assigned works as per the following schedule:

- Preliminary Design Report within 2 (Two) week from the date of signing of the contract.
- Draft Report within 1 (One) month from the date of signing of contract.
- Final Report within 45 (Forty-five) days from the date of signing of contract.

8. Payment Schedule

If not indicated otherwise, the payment shall be made as mentioned below:

- 60% after approval of preliminary design, including Dam plan, architectural drawings and landscaping drawings and Initial Environment Examination (IEE) reports
- 40% after approval of final design, including structural calculations and structural drawing and after preparation and approval of cost estimates, final BoQs and other contractual documents

The deduction of 5% of security deposit shall be made from all payments. The security deposit will be refunded to the Consultant after the successful completion of the contract.

9. Qualification, Experience and Responsibilities of Key Staff

S.N.	Position	Desired Requirements	Key Tasks
1	Structural Engineer (Team Leader)	Master's degree or PhD in Civil Engineering and at least 5 years of experience in dam design	Responsible for layout, and structural design of proposed dam, and its optimization
			Responsible for overall quality and timelines of deliverables
			Manage team members
			Lead communications with municipal officials and ensure frequent and quality communications
2	Geo-technical Engineer	Master's degree in Geology/ Geo-technical engineering with approximately 5 years of experience on geological studies or related field.	Tasks as outlined and requested by Team Leader
3	Tourism Specialist	Master's degree in Tourism studies with approximately 5 years of experience on tourism development at both regional and city level	Provide inputs into the preparation of tourism development and management plan
			Tasks as outlined and requested by Team Leader
4	Environment Expert	Master's degree in Environmental science with approximately 3 years of experience preparing environment impacts assessments	Tasks as outlined and requested by Team Leader
5	Mechanical Engineer	B.E. in Mechanical Engineering (Masters Preferable) with 3 years of experience	Selection and design of mechanical components
			Tasks as outlined and requested by Team Leader
6	Civil Engineer	Bachelor in Civil Engineering (Masters Preferable) with 1-3 years of experience in infrastructure projects/ municipal projects	Tasks as outlined and requested by Team Leader
7	Mechanical Engineer	B.E. in Mechanical Engineering (Masters Preferable)	Tasks as outlined and requested by Team Leader

S.N.	Position	Desired Requirements	Key Tasks
8	Electrical Engineer	Bachelor in Electrical Engineering (Masters Preferable)	Tasks as outlined and requested by Team Leader
9	Architect	Bachelor in Architecture (Masters Preferable) with 1-3 years of experience in infrastructure projects/ municipal projects	Tasks as outlined and requested by Team Leader
10	Senior Surveyor	Diploma in Surveying/ Civil Engineering with 5 years of experience	Tasks as outlined and requested by Team Leader

- ❖ *Consultants may associate with other consultants to enhance their qualifications.*
- ❖ *A sole firm or a joint venture of consulting firms shall apply.*
- ❖ *For joint venture of consulting firms, agreement among them should be attached.*