RISK ASSESSMENT AND RISK MANAGEMENT PLAN  
(Nepal: Detailed Engineering Study for the Upper Seti Hydropower Project)

1. The project requires only consulting services for detailed design; thus anticipated implementation risks are generally considered low and will be minimized through mitigation measures. Major risks and mitigating measures are summarized in the table.

### Risks and Management Plan

<table>
<thead>
<tr>
<th>Risks</th>
<th>Assessment without Mitigation</th>
<th>Management Plan or Measures</th>
<th>Assessment with Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor technical performance by the consultant</td>
<td>Medium</td>
<td>Provision in the consultant selection criteria for adequate similar technical experience</td>
<td>Low</td>
</tr>
<tr>
<td>Lack of coordination between the consultants of the detailed engineering study and the project preparatory TA</td>
<td>Medium</td>
<td>Provision in the contracts defining supervision of the project preparatory TA consultant on the detailed design study consultant</td>
<td>Low</td>
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<tr>
<td>Lack of funding for further investigation</td>
<td>Low</td>
<td>Adequate provision of contingencies</td>
<td>Low</td>
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<tr>
<td>Delay in implementation</td>
<td>Low</td>
<td>Advance contracting and close supervision of the steering committee and ADB</td>
<td>Low</td>
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</tbody>
</table>

Overall: Low

ADB = Asian Development Bank, TA = technical assistance.


2. The Study's major implementation risk will be lack of consultant experience. Consultant selection will be based on assessments of adequate experience in similar detailed engineering studies. To further ensure its technical advantages, a consulting firm or a consortium of firms will be engaged using the quality- and cost-based selection method of the Asian Development Bank (ADB) with a standard quality to cost ratio of 90:10.

3. The Study's output quality will determine input value of the associated project preparatory technical assistance (the PPTA). While the Study and the PPTA have clearly demarcated responsibilities, the coordination mechanism between the two consultants will need to be clarified. Considering the input–output relationship, the consultant's engineering work of the Study will be reviewed and guided by the PPTA consultant who will finalize cost estimates and tender documents. This will be assured in the contracts for the two consulting services.

4. While the government and the Nepal Electricity Authority have already budgeted their contributions to the Study, adequate provision for contingencies under the Study will mitigate the risk of the shortage of funds for further studies if any. To ensure the cost effectiveness of the entire design works, engineering–procurement–construction type contract(s) will be considered

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1 The particular experience will include (i) design for concrete gravity dams, tunnels, underground powerhouse for hydropower development; and (ii) evaluation for geological conditions, rock mechanical tests (e.g., block shear test, plate bearing test, and hydraulic fracturing test), and hydraulic model test, sediment flashing facilities except desanding basin types.

2 According to ADB's Project Administration Instructions 2.02 Part A, para 7, the detailed engineering design for the dam could be based on the 90 to 10 quality- and cost-based selection weighting.
to apply for some standard facilities of the ensuing investment project, \(^3\) while the key structure of dams and sediment flashing systems will be designed through in-depth tests and analyses under the Study.

5. The risk of implementation delay will be mitigated by advance contracting and close supervision by ADB and the steering committee. To ensure smooth implementation of the Study and the PPTA and move toward the ensuing investment project, the security situation in the project site will need to be ensured. Compared with other hydropower project sites in Nepal, the security and accessibility to the project site is assessed satisfactory. The successful implementation of the two project preparatory works (the Study and the PPTA) will reduce the processing and implementation risks of the ensuing investment project.

\[^3\] Whether to apply engineering–procurement–construction contracts for the ensuing investment project will be assessed through more studies of various risks and benefits under the Study and the PPTA.