1. Background

River is the mirror of society. Many ancient civilizations were flourished on the bank of the river. Rivers maintain ecological balance as well as provide source of income if managed properly. Fishes and riverbed materials (sand, cobble, pebble, boulders, etc.) are the sources of income from natural rivers. Within those ecosystem services, the extraction of river bed material is one of particularly important types of human activity in river ecosystems. Sand and gravel mining have been a serious environmental problem around the globe in recent years. Instream mining directly alters the channel geometry and bed elevation. By removing sediment from the channel, instream material extraction disrupts the pre-existing balance between sediment supply and transporting capacity, typically inducing incision upstream and downstream of the extraction site. The resultant incision alters the frequency of floodplain inundation along the river courses, lowers valley floor water tables and frequently leads to destruction of bridges and channelization structures.

For the development purposes the natural resources like river bed material (Sand, gravel, Cobbles and boulder) are the major raw material. The development of the country is mainly focused on the growth of urbanization and industrialization of that country. The increasing demand of river bed materials, the illegal mining (sand mafia) and mining in the agricultural field, floodplain area is increasing and its effect the health, physical process and different function of rivers, degradation of the riparian zone, degradation of aquatic and terrestrial biodiversity. There are many environmental effects are generated due to the unscientific and up hazard river bed mining.

The Local Government Operation Act, 2074 (LGOA) vests the ownership of the rivers within the territory of the Municipality and the sediments thereof on the Municipality. The LGOA and Constitution of Nepal empowers Local Governments in planning and implementation of the local infrastructure's development. These legal and Constitutional measures give the authority to the local Government to collect the tax and fees on the use of these riverbed materials. Besides, as per the Act, Bheerkot Municipality has the responsibility to reduce and mitigate natural as well as human induced hazards. As such, these rivers present a huge opportunity to this municipality for revenue generation to invest on overall development of the municipality at the same time safeguarding the people from water induced hazards.

In such instance, Bheerkot Municipality is looking for the proposal from interested VAT registered firms and companies to conduct Initial Environmental Examination (IEE), prepare report and get approved from the concerned authority.

1.1 The proponent

The activity under the question is entitled "Sustainable extraction of riverbed materials from Aandhikhola river within Bheerkot Municipality." Bheerkot Municipality is the executing implementing agency of the activity at the municipal level and the proponent of the Initial Environmental Examination (IEE) study for the activities. The name and address of the Proponent is as follows:

Bheerkot Municipality
Bayarghari, Syangja, Gandaki Province

Dharmaraj Dhungana
Chief Administrative Officer

Contact No. 063400106
Email: info@bheerkotmun.gov.np,
Website: www.bheerkotmun.gov.np

1.2 Brief Description of the Proposal

Bheerkot Municipality is seeking to sustainably extract the riverbed materials from different Location of Aadhikhola River in the quantity of 100 m^3-300 m^3 per day.

1.3 Relevancy of the Proposal

Aadhikhola rivers carry massive amount of sediment load and deposition occurs along the rivers channels thus resulting riverbed mounting and flood plain area widening. Due to these, water induced hazards are accelerating every year. Thus, the activity has been proposed to:

- Reduce the risk of water induced disaster like flood, soil erosion, river cutting, etc in the upstream and downstream region.
- Boost up the economic condition through the collection and exploration of river deposits like boulder, pebbles, gravel and sand.

1.4 Rational of IEE

Any development activities have some environmental implication, whether beneficial or adverse. Therefore, it is pertinent to identify the complications/changes apparent in the physical, biological, socio-economic and cultural environmental condition of the project area along with the favourable or adverse impacts resulting from the activities associated with the activity.

Bheerkot Municipality is looking forward to extract river bed materials in the quantity of 100 m^3-300 m^3 per day from different rivers and streams. According to the statutory requirement of the Government of Nepal, (GoN) defined by Environmental Protection Act (EPA), 2076, Chapter 2 Section (3) refereed by Sub-Section2 Ga (ग) and of Environmental Protection Rule (EPR), 2077 Schedule 2 under Mining Sector (ट (१)), it is mandatory to conduct IEE for the extraction and collection of riverbed materials if the extraction of 100 m^3-300 m^3 per day has to be done. Abide by these provisions Bheerkot Municipality is looking forward for proposals for conduction of IEE for extraction of river bed materials from Aandhikhola river within Bheerkot Municipality.

1.5 Objectives of IEE

The main objective of the IEE study is to access and inform decision makers by identifying the potentially significant environmental effects and risks of the proposed project and to suggest appropriate mitigation measures to mitigate/minimize the adverse impacts so that the project is implemented in an environmentally sound manner. The objectives of this IEE are:

- To document the physical, biological and socio-economic and cultural baseline condition of the project area;
- To identify, predict assess the adverse and beneficial environmental impacts of the proposed project in project affected area in terms of magnitude, extent and duration during the extraction phases;
- To suggest appropriate and pragmatic mitigation and enhancement measures for potential adverse impacts.

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- To familiarize various stakeholders with the IEE outcomes through public consultation and participation programs and to incorporate their relevant concerns and issues in environmental management plan;
- To prepare an environmental action plan as well as effective monitoring and auditing programs; and
- To facilitate informed decision making including setting the environmental terms and conditions for implementing the proposed project.

2. Methodology

The firms undertaking this assignment should strictly follow the procedures provisioned in Environment Protection Act 2076 and Regulations 2077 to maintain the quality of the report. The methodologies could be but not limited to the following:

2.1 Literature Review/Desk Study

The consultant team should undergo extensive review of published and unpublished readily available sources of relevant information. Such sources of information include publications of CBC, DCC, Municipality, NGOs, Irrigation Office and all other relevant institutions. Similarly, the necessary information is also available in topographical maps. DHM record, IUCN red book etc. The consultant should review all the plans, policies, acts, rules and regulations, guidelines, strategies and standards that are attracted during or will govern IEE and the project regulation.

2.2 Site Visit and Field Works

The team will conduct field visit to the proposed site for both primary and secondary data collection based on physical, biological and socio-economic environment. Primary data will be collected through interaction with the public. Secondary data will be collected through websites, papers.

2.3 Household Survey

It should be conducted to gather pertinent information on demography, education and skill, land holding, income/expenditure, etc.

2.4 Stakeholder Consultations

Consultations at different levels to gather relevant information, issues and concerns.

2.5 Focus Group Discussions

It can be conducted at different locations at the proposed sites with different types of local groups like concern communities, community forest user groups, etc whereby intensive discussion will be held about the environmental sensitivity and concerns in the area, importance of environmental features located in the area, present status, and present problems of difficulties, potential solutions and consequences that are related in minimizing the possible impacts.

2.6 Key Informant Survey

Survey with the local leaders, teachers, health workers, government of officials and other knowledgeable persons through field investigation and checklists tools.

2.7 Questionnaires and Checklists

The team should use standard field data collection tools like structured and semi-structured questionnaires and checklists to guide collection of data and information that is pertinent to the study.

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2.8 Impact Identification, Prediction and Evaluation

The consultant should identify and evaluate both possible and adverse impacts of the project operation on physical, biological and socio-economic domains of environment. The impacts should be classified in terms of Magnitude (High, Medium and Low), Extent (Regional, Local and Site-specific) and Duration (Long-term, Medium-term and Short-term).

2.9 Public Hearing

The study team should, in coordination with the proponent, should organize and facilitate public hearing programs to disseminate IEE report.

2.10 Review and Incorporation of Comments

The study team should present the IEE report in review meeting at the concerned authority and incorporate the comments to finalize the IEE report.

3. Issues to be Considered in IEE

The proponent should consider following issues during the preparation of IEE report.

3.1 Physical and Chemical Environment

- Landscape disturbance
- Sediment transport/Scouring
- Air quality (if it is possible)
- Noise level (if it is possible)
- Hazardous due to spoil disposal
- Pollution of water resources
- Water flow Disruption
- Impact on micro-climate

3.2 Biological Environment

- Loss of forest (Forest type and Available plant species)
- Pressure on Forest due to riverbed material extraction activity(firewood/timber)
- Pressure increased on forest (firewood/timber)
- Possible impact on flora and fauna (biodiversity)
- Impact on aquatic life and their habitat
- Disturbances to wildlife habitat movement
- Impacts on rare, endangered, protected and threatened species of flora and fauna and their habitat

3.3 Socio-economic Environment

- Impact due to influx of workforce in search of economic opportunities
- Impacts due to occupational health and safety hazards
- Issues related to change in social, structures, cultural and traditional practices of the people due to exposition to the outside workforce
- Issues related to dispute between outside workforce and local labors
- Issues related to pressure on existing infrastructure facilities such as health and safety, education, communication, water supply, etc. due to the larger number of outside workforces along with their families

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Risk of diminished local traditional occupation and skills, such as handcraft, indigenous medicinal practices, agro-based and forest product-based cottage industries
Impact due to encroachment on cultural, historical and religious sites
Impact on aesthetic value
Impact on withdrawal in economic activities and employment opportunities
Impact on gender and vulnerable groups

3.4 Beneficial Issues

Reduction of flood and other related hazards due to river channelization
Revenue generation for overall development of the district
Employment opportunity and human resource development
Increase in economic opportunities due to increase in trade and business and demand forgoods and services

3.5 Mitigation and Enhancement Measures

The IEE study identifies, predicts, and evaluates the impacts of Extraction of Riverbed Materials (Sand, Gravel and Stone) on the environment. The ToR should indicate to document the environmental protection measures, both benefits augmentation measures and adverse impact mitigation measures in the IEE report. Mitigation measures can be categorized as preventive, corrective and compensatory measures.

3.6 Environmental Monitoring Plan

The proponent should prepare a detailed monitoring plan in terms of baseline, compliance and monitoring plan to assess the actual physio-chemical, biological, socio-economic and cultural effects of the project. The impact and baseline monitoring plans should indicate parameter, indicator schedule and method for monitoring. The cost of comprehensive monitoring plan and feedback should be included in the overall-monitoring program of environment management plan. The format for presentation and recording of data should be provided with whole monitoring activities and information and monitoring schedule in a chart.

3.7 Alternative Analysis

All the possible alternatives should be examined in order to achieve the identified objectives of the project and additionally to minimize the adverse impacts and maximize the benefits in the context of the benefit foreseen and risks of environmental hazards. The following alternatives should be dealt in details:
No Action Alternative/ Do nothing Alternative
Design Alternative
Operation alternatives in terms of technology, procedures, and schedule
Location alternatives
Other alternatives

3.8 Environment Management Plan

EMP should include activities, impacts, mitigation and enhance measures, organizations responsible for the implementation of the mitigation measures and monitoring activities, schedules, cost and mode of co-ordination with the line agencies, Municipality, and local

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people. It should also identify the human resources requirement of the monitoring and mitigation works, quantify the man-month schedule and develop an action plan for all identified measures. The plan should also include monitoring procedure and especially the mechanism for compliance monitoring by spelling out the responsibilities of each concerned stakeholders.

4. Timeline and Reporting

4.1 Time and Reporting:

The study should be completed within 1.5 months after the date of contract signing. The firm should provide detail workplan of the study for the given time duration.

Terms of Reference (1 Copy): Within 10 Days from Agreement

Draft Report (1 Copy): Within 25 days from Agreement

Final Report (2 Copies): Within 45 days from Agreement

4.2 Team Composition:

The team composition for undertaking this assignment should be in accordance to the Schedule 13 relating to the Rule 7 (6) of the Environment Protection Rules, 2077. The team may include:

Environmentalist / Forestry Specialist / Ecologist (Team Leader)

Natural Resource Expert/Forestry Expert

Geologist /Geotechnical Engineer / Eng. Geologist

Hydrologist

Sociologist

Field Assistants

The team members should meet the minimum qualification and experience criteria mentioned in the Schedule 13 relating to Rule 7 (6) of the Environment Protection Rules, 2077.

4.3 Other Requirements

a. Final IEE report preparation and submission to Bheerkot Municipality after the approval from the concerned authority mentioned in Environmental Protection Act (EPA), 2076, Chapter 2, Section (3) refereed by the Sub Section 2 Ga (ग) no later than two months from the date of contract. The approval process may require preparation and submission of report and presentation of the report as well as incorporating the amendments if any, suggested by the IEE approving body.

b. The responsibility of presentation to the approving agency and getting the approval of the IEE rests upon the successful bidder.

c. The conditions/requirements mentioned in the notice published by Bheerkot Municipality regarding the invitation of the proposal should be read as integral part of this ToR as well.

d. The terms and conditions mentioned in this ToR will apply for any related issue, whereas the rest will be addressed in accordance to the prevalent rules and regulations of the Government of Nepal.

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Rules and Regulation

The study should be carried out with the minimum rule and acts by the consultant during carrying out the studies of the Initial Environment Examination in this study.

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