GOVERNMENT OF KHYBER PAKHTUNKHWA
IRRIGATION DEPARTMENT

(Final updated TOR approved by DCSC)

REQUEST FOR PROPOSAL

FOR

PROCUREMENT OF CONSULTANCY SERVICES FOR "REVIEW & UPDATION OF FEASIBILITY STUDY, DETAILED ENGINEERING DESIGN, PREPARATION OF TENDER DOCUMENTS & PC-I OF BARA DAM MULTIPURPOSE PROJECT, DISTRICT KHYBER"

AIP ADP NO.2463/195188 (2020-21)

DIRECTORATE GENERAL SMALL DAMS
April2021

“REVIEW & UPDATION OF FEASIBILITY STUDYBARA DAM MULTIPURPOSE PROJECTDETAILED ENGINEERING DESIGN, PREPARATION OF TENDER DOCUMENTS & PC-I

TERMS OF REFERENCE (TORs) FOR CONSULTANT

1. PROJECT IMPLEMENTATION

PART–I MODE OF IMPLEMENTATION/ORGANIZATION OF STUDY

1. Consultant will work under administrative control of Director General Small Dams/PMU Bara dam Irrigation Department, Khyber Pakhtunkhwa.
2. Irrigation Department, Khyber Pakhtunkhwawill periodically review and advise on specific issues/ activities of Consultants. Irrigation Department, Khyber Pakhtunkhwa will review the drafts of various reports/memoranda of Consultants before finalization.

INSTRUCTION REGARDING SUBMISSION OF PROPOSALS:

1. Three copies of the technical and one copy of financial proposals in stapled/fixed binded form are required to be submitted. Proposal should be in a sealed envelope indicating original or copy on each enclosure, as appropriate.
2. The proposals shall be valid for a period of 120-days after the last date of submission, which is extendable on the expiry of above period through mutual agreement.
3. The technical and financial proposals of the consultants will be evaluated according to criteria for procurement of consultancy services of the Government of Khyber Pakhtunkhwa, applying weight-age formula of 80:20 for technical and financial proposals respectively.
4. Financial proposals of "Technically Qualified" consulting firm will be considered and opened by competent forum in presence of the competitive firms’ representatives. The contract agreement with successor firm will be governed by laws and regulations of the Govt. of Khyber Pakhtunkhwa. Financials proposal are also required to be submitted along with the Technical proposal in separate envelops.
5. Your technical proposal should include the following information as well.
   i. Year of formation, year of registration of the firm, postal address, e-mail, telephone/fax numbers with name of partners/proprietor and head and branch offices.
   ii. Registration Number and latest renewal certificate of Pakistan Engineering Council.
   iii. National Tax No. (NTN) with copy of the certificate.

iv. List of Similar nature works completed by the firm during last 10 years with detail of year of start/completion, cost of consultancy services, scope of the work and actual services performed by the firm individually and / or in a joint venture with specific details to be given in annexure.

v. List of Similar nature works in hand with cost of consultancy services, scope of the work and actual services performed by the firm, date of start and expected date of completion individually and / or in a joint venture with specific details to be given in annexure.

vi. Only those similar projects will be considered for evaluation for which the scope of services is mentioned in the data sheet of the firm furnishes evidence to this effect.

vii. The experience of the firm includes project handled by the firm and not by the individual employees of the firm in their personal capacity.

viii. List of professional staff and CV's of the key experts (duly signed by them or by the authorized representative of the firm) who will be handling the assignment with names, qualifications, year of passing various degrees and post qualification practical experience.

ix. A comprehensive write-up about approach and methodology, proposed work plan and manning schedule of various experts on a bar chart showing man-months of each expert, their responsibility and total time schedule for completion of the assignment.

6. Any clarification on the TORs and EOI may be sought before last date of submission of the proposals.
7. The employer reserves the right for any addition alteration or amendment in the TOR of the Project and continues or discontinues consultancy services.
8. Consultants shall be responsible for payment of all kind of taxes (direct & indirect both), levies etc in vogue time to time by Govt. in respect of personnel and other activities with no liability to the client.
9. Originally signed CVs of the proposed personnel having contact number and postal address along with availability certificate of the personnel for the Project shall be annexed in the Technical proposal.
10. The Consultants cost shall be inclusive of all kind of Taxes (direct & indirect both), levies etc. However, the Sales Tax as per applicable law shall be mentioned separately.

11. The Consultants' financial bid/ proposal shall be deemed to cover expenses for each and every item of the scope of work/TORs. No payment shall be made for any item(s) mentioned in scope of work/TORs that the Consultant have intentionally or unintentionally presented as conditional, missed or not included in their technical and financial proposal. The consultants shall have to perform the same at their own expenses.
12. Payment for the personnel will be made as per actual time consumed on the Project but not in excess of the provision of man months made in the T.O.R. of Consultancy.
13. Payment to the Consultants for the survey and Geo-technical investigation and other investigation (if required) will be made as per actual work done at the site on approved MRS.
14. On the satisfactory performance of the services, the payment to the Consultants shall be made as per actual inputs, while in case of incomplete assignment; the payment will be made for the work done in accordance with the breakup of the services submitted by the Consultants and as determined by the Employer/Client.
15. Security deposit and income tax/sale tax etc will be deducted as per the prevailing Government rules notified during currency of the project.
16. The Consultant shall establish complete Project Office at Peshawar/nearest to site.
17. Consultants shall appear in Project meetings and site visits and shall also make presentation if so directed by the department for which no TA/DA, boarding, lodging and claim for incidental charges etc, shall be entertained.
18. The Consultant except with prior approval of the competent authority shall not sublet the study or any part thereof.
19. The Consultants will provide undertaking for the effect that the key staff would not be employed on the other projects during the currency of this project. Any violation will liable the contract for termination.
20. If the Consultant fails to complete any activity or part of the activity, the client reserves the right to execute the same at the consultant risk & cost.
21. If a project or part of project is dropped due to any reason, man months of the consultant key staff and logistics will be curtailed proportionally.
22. Consultant will be responsible for security of their staff. However, the security issues will be taken up with concerned security agencies.
25. Consultant shall provide indemnity bond.
26. Employer reserves the right to replace/withdraw/shared vehicle, person and equipment from the consultant if required.

27. The Consultant will have to adjust given/estimated Man-months for entire period till completion.

28. TORs will be part of contract agreement.

29. Third Party validation (if required) of the Detailed Engineering Design local or International (as required by the Employer), will be the responsibility of the consultants, to get verify their contents of the study.

30. During the course of Detailed Engineering Design, the Consultants will arrange minimum of three secessions of Capacity building of the Departmental Staff/ Engineers regarding design related activities of Dams and Hydropower.

31. If the client (Irrigation department, Government of Khyber Pakhtunkhwa) suffer any loss due to proven design faults by the design consultants, then the consultants shall have to reconstruct the said failed structures at their own cost.

32. The successful bidder/consultancy firm will deposit performance security @ 5% of bid cost in shape of bank guarantee or CDR as per KPPRA rule. (Para 24.2 standard procedure for selection of consultant).

PART-II BACKGROUND INFORMATION OF THE PROJECT/STUDIES

Location:

The proposed dam site is located on Bara River in District Khyber, Khyber Pakhtunkhwa about 3.7 km upstream of the existing weir of Bara Canals Irrigation Department, Khyber Pakhtunkhwa Scheme (BCIS), also locally known as Sapera Dam and 35 km from Peshawar City, Khyber Pakhtunkhwa. Dam site co-ordinates are 33° 50' 13" N and 71° 19' 12" E.

General description:

District Khyber is an important administrative unit of Khyber Pakhtunkhwa, Pakistan. The district has limited land and water resources, most of which are located within Bara River basin.

At present two major Irrigation Department, Khyber Pakhtunkhwa schemes exist on Bara River; namely Bara River Canals Scheme (BRCS) and Bara Canals Irrigation Department, Khyber Pakhtunkhwa Scheme (BCIS). These Irrigation Department, Khyber Pakhtunkhwa schemes play an important role in the agro-economic development of District Khyber and the adjoining areas of Peshawar. However, over the years, these have not been functioning to their respective design capacities due to lack of assured Irrigation Department, Khyber Pakhtunkhwa water supplies. The proposed Bara Dam Multipurpose Project is envisaged to overcome these water shortages and put the Irrigation Department, Khyber Pakhtunkhwa schemes back to their maximum efficiencies as far as possible.

a. Project Area:

Bara Dam Multipurpose Project is located on Bara River in District Khyber, Khyber Pakhtunkhwa. The catchment area at the proposed site is about 1,793 km^2, extending both in Khyber and Orakzai Districts. The reservoir of the proposed dam extends both in Bara and Mastura valleys.

District Khyber is an important tribal unit of Khyber Pakhtunkhwa. It lies between latitude 33^0 45' to 34^0 20' N and longitude 70^0 27' to 71^0 32' E. The District is bounded on the North by Afghanistan and District Mohmand, on the South by District Orakzai, on the West by District Kurram and on the East by District Peshawar.

b. Physiography:

The proposed dam site is situated South-West of Bara Fort within the mountainous terrain of Miri Khel village that borders the South-Western extremity of Peshawar Basin. A few km downstream of Miri Khel near Jhansi Post, the mountainous terrain gets in an abrupt contact with alluvial plains of Peshawar Basin. These plains form the cultivable command area of BRCS. The lands below the proposed Bara Dam command area are irrigated through Warsak Canal System.

The catchment of the Project extends up to Afghanistan and comprises mostly hilly and mountainous terrain with small alluvial filled valleys in between. The land is often severely denuded due to erosion, deforestation and overgrazing.

c. Climate:

The climate of the Project area is hot and arid. Maximum temperature in summer (June) exceeds 40.2^0 C and in winter (January) minimum temperature falls below 5.5^0 C.

d. Hydrology

The catchment area at the dam site is about 1,793 $km^2$and comprises drainage basins of Bara and Mastura Rivers, each having basin area of 1,063 and 730 km^2, respectively. Nearly 85 percent of the catchment comprises moderately to high relief mountainous terrain.

e. Water Availability

Bara River carries perennial flows due to snow melt and runoff due to rainfall over the catchment. The high flow months are April and May, while minimum flow occurs in January. The daily flow data of Bara River gauged at Jhansi Post has been used for estimation of water availability. The average annual water availability of Bara River has been worked out as 243 MCM.

The year-by-year monthly flow volumes show that the maximum volumes are available in the months of April and May which be on average about 43.5 MCM (35,266 AF) and 41.7 MCM (33,807 AF), respectively. The minimum flows are observed in the month of February which show an average volume of about 10.9 MCM (8,837 AF). The months from October to February are the low flow months with an average flow of around 11.1 to 14.2 MCM.

f. Sedimentation

Average annual suspended sediment load is about 1.39 million short tons (MST). To account for the bed load, it has been increased by 15% and total annual sediment load works out to be 1.594 million short tons (MST).

g. Geology

1. Regional Geology

The Project area is broadly located in NW Himalayan Fold and Thrust Belt that extends East-West, from Parachinar in the West to Kashmir in the East. This fold and thrust belt

comprise Sub-Himalayan mountain ranges in the Southern part and Lesser Himalayan mountain ranges in the Northern part. More precisely, the dam site is located in the Northern fringe of Lesser Himalayas which is a linear, East-West extending highly folded and deformed mountain belt called Parachinar-Kalachitta-Cherat-Margalla Fold Belt.

Locally the dam site lies in the Northern part of Kurram–Dara Adam Khel Range and is bounded in the North by Panjal Thrust at a distance of about 10 km and Main Boundary Thrust (MBT) in the South. Main Boundary Thrust (MBT) is East-West oriented structural feature that extends from Himalayan Kashmir Syntaxes in the East to Parachinar in the West.

2. Dam Site Geology

The dam site comprises rocks belonging to Murree Formation of Miocene age. This Formation comprises dominantly siltstone with thin beds of sandstone. The beds are oriented slightly oblique to the dam axis and dip at steep angles towards downstream.

The orientation of beds shows signs of swinging and dragging effects at many locations. The beds exhibit vertical and lateral gradational variations in composition and texture. The strata are generally medium to closely jointed and fractured; however, the joints are mostly tight, relatively less persistent and irregular.

3. Right Abutment

Right abutment comprises a fairly smooth and uniform slope. The slopes up to 100 m elevation above riverbed angle between 25 and 30 degrees, while the slopes further upward are relatively milder. At places the outcropping sandstone beds accentuate the uniformity of slope.

There are hardly any significant accumulations of Quaternary deposits on the abutment. These Quaternary deposits are in the form of discontinuous veneer comprising poorly sorted to unsorted, coarser detrital material with predominance of angular rock fragments of variable sizes over the well-rounded gravel, cobble and boulder fraction, along with finer cohesive matrix.

4. Left Abutment

Left abutment is a linear body with moderate side slopes. The linear body shortly joins the main hills in the NW, forming a saddle in between which is fairly wide with stable gravity. Above the river bed, the abutment comprises a uniform slope that projects to an elevation of 709 m having slope angles ranging between 25 and 30 degrees. The abutment slope is stable and for most part bedrock is exposed except a few isolated locations where Quaternary deposits are present.

The abutment consists of alternate monotonous sequence of siltstone and sandstone beds of Murree Formation. The Quaternary deposits are of surficial nature and comprise medium dense to dense, poorly sorted, coarser detrital material with predominance of sub-angular to angular rock fragments of gravel-cobble size, supported by little cohesive matrix. The abutment top is covered by terrace deposits comprising well graded and stratified, sub-rounded to rounded gravel, cobble and occasional boulders, embedded in well compacted fine matrix. The terrace deposits are invariably cemented and range in thickness from 01 m to more than 03 m.

5. Valley Section

The river bed at the dam axis is about 20 meters wide and covered by about 06 m thick river bed deposits. These deposits comprise predominantly loose to medium dense, well sorted, sub-rounded to sub-angular, gravel, cobble and boulders having sedimentary and metamorphic origin with finer matrix of silt and sand in varying proportions and minor clay. Along the banks the coarser (cobble, boulder) fraction is pronouncedly increased.

The river bed deposits are underlain by a thick sequence of Murree Formation comprising weak to moderately strong, close to medium jointed monotonous sequence of siltstone and sandstone. However, an overall predominance of siltstone over the sandstone strata is observed on both banks near the water line which is indicative of lower Murree facies. The beds are oriented almost parallel to dam axis or across the valley. The beds dip towards downstream at high angles. The bedrock is close to medium jointed mostly exhibiting variable orientations and high angle dips.

h. Existing Agriculture Practices

Two Irrigation Department, Khyber Pakhtunkhwa schemes already exist on Bara River. It includes BRCS and BCIS having Culturable Command Area (CCA) of 14,739 ha (36,420 acres) and 2,148 ha (5,309 acres) respectively. About 30 to 40 percent of the CCA is being currently irrigated under water stressed conditions. More than sixty (60) tube wells, both government and non-government, have been installed in CCA due to extreme water shortages to meet agriculture demands. Irrigation Department, Khyber Pakhtunkhwa networks of these schemes have already been developed and require only rehabilitation and improvement. However, problems of water rights will be addressed with the consultation of all the stake-holders.

1. Major Components of the Project

a. Main Dam

At proposed dam site, 92 m high and 425 m long, Earth Core Rockfill Dam (ECRD) with a gross storage of 105 MCM will be constructed on Bara River. A free board of 1.65 m will be provided considering wind speed, wave height and fetch of the reservoir.

b. Dyke

A zoned embankment dyke with a central impervious core will be provided at the natural saddle present on the left abutment. The maximum dyke height above deepest point of the saddle will be 09 m with the crest length of 320 m.

c. Spillway & Stilling Basin

Main spillway, consisting of a weir with an ogee type crest, a chute and a deflector bucket, will be constructed near the right abutment. Spillway is designed to cater for Probable Maximum Flood (PMF) of 10,743 m^3/s. It will pass design discharge with a crest length of 205 m at maximum conservation level of El. 691 m.

A sky jump / flip bucket is proposed as energy dissipation structure where energy dissipation is achieved when trajectory of flow bursts because of entrained air somewhere above the downstream water level.

d. Intake and Outlet System

The Intake and Outlet system will be designed to deliver the maximum demand of 9.29 m^3/s to meet the Irrigation Department, Khyber Pakhtunkhwa and water supply demands.

Inlet-outlet works will consist of a sloping inlet shaft, a 2.0 m diameter outlet tunnel, penstocks and bypass conduit.

Intake structure consists of a rectangular reinforced concrete box section running down along the upstream face of the dam body with three openings at different levels (1st at El 660 m, 2nd at El 670 m and 3rd at El 680 m respectively).

e. Power Generation

Power house will be located on the right bank just downstream of main dam body. Its design discharge ranges from 2.8 m^3/s to 8.4 m^3/s as the tune of 06 MW (29.14 GWh with a plant factor of about 0.56)

f. River Diversion Works

River diversion works will include construction of upstream & downstream cofferdams and three diversion tunnels. An upstream 40 m high coffer dam will be designed to cater floods of 25 years return period and downstream coffer dam will be 20 m high considering the tail water levels. One diversion tunnel of 08 m diameter and two of 06 m diameter will be designed through left abutment. The average length of each tunnel will be about 300 m.

g. Flushing Outlet /Low Level Outlet

One of the 06 m diameter diversion tunnel will be later on converted into low level outlet for flushing the sediments by providing steel conduit (diameter02 m)within the tunnel.

h. Command Area Development

Two Irrigation Department, Khyber Pakhtunkhwa schemes already exist on Bara River including Bara Canals Irrigation Department, Khyber Pakhtunkhwa Scheme (BCIS) near Bara Fort and Bara River Canals Scheme (BRCS) further upstream. The water released from the dam will feed the combined CCA (16,887 ha) of existing Irrigation Department, Khyber Pakhtunkhwa system.

PART - III AVAILABLE REPORTS, STUDIES DATA AND INVESTIGATIONS

Following studies has been carried out on Bara Dam Multipurpose Projectsince 2002:

Perspective Planning Study of Small Dams in FATA (2002)

EX-FATA Secretariat carried out a study for the construction of a storage dam on Bara River under “Perspective Planning Study of Small Dams in FATA” in 2002. The Project was however transferred to EX-FATA DA in April 2007.

Feasibility Study (2008)

EX-FATA DA completed the Feasibility Study in 2008. Out of four (4) potential identified dam sites, Feasibility Study recommended Earth Core Rock Fill Dam (ECRD) with ogee type spillway, located about 01 km downstream of the confluence of Bara and MasturaRivers. The Site has maximum reservoir capacity (84 MCM), favorable topography and no major technical defects. At the Feasibility Stage three hydro-turbines with total installed capacity of 4.8 MW were proposed.

PART-IV OBJECTIVES OF PROPOSED STUDY

The main objective of the Project is the irrigated agriculture development of under developed region of the country to increase agricultural production.It will also provide increase production leading to self-sufficiency in food and fiber.

a. The study is aimed to conduct Detailed Engineering Design of the scheme, including power component, preparation of PC-1 and Tender/ Bidding Documents.

b. The study is also aimed at establishing the bankable engineering design of Bara Dam Multipurpose Project with due consideration of its water benefits, including Irrigation Department, Khyber Pakhtunkhwa, agriculture, hydropower potential and fisheries developments.

c. The activities will cover undertaking of further studies, investigations, surveys required to confirm and upgrade the previous results and economic, financial, social and environmental aspects of the Project already conducted during Feasibility Stage.

d. The investigations and studies shall be of such a quality to allow Irrigation Department, Khyber Pakhtunkhwa andGoKP to arrive at a definite decision concerning implementation of the Project.

e. Overall level of study and the degree of details on each aspect shall be sufficient to meet acceptability criteria of international donor agencies that can be approached to assist for funding of the project at construction stage.

Project aims to meet the following objectives:

a) Irrigated Agriculture Development (16,887 ha);
b) Flood Mitigation;
c) Drinking Water Supply to nearby community;
d) Hydropower Generation (06 MW);
e) Fisheries Development;
f) Ground Water Recharge; and
g) Socio-Economic uplift of the area.

To accomplish the task, Irrigation Department, Khyber Pakhtunkhwa will hire the Services of Consultants through “National Competitive Bidding” process. The consultant will be responsible to carry out all studies/Investigation which are mandatory in the proposed study. International consultants firms shall also be allowed to participate in J/V with Pakistani based eligible consultants firms as per PEC guidelines/laws .

PART-V SCOPE OF WORK OF PROPOSED STUDY

Consultants will review the previous studies and undertake additionally required studies/investigations. Based on the overall data, studies, survey and investigations, the Consultants will accomplish the assignment in the sequence hereunder:

Overall

The assignment will involve:

- Review Feasibility Report and update all existing studies, reports and data available;
- Carrying out investigations/survey (in the manner laid down at para 7 of Part-I above); and
- Preparation of Project Planning Report, Detailed Engineering Design, Tender Documents& PC-I.

The assignment will be accomplished in following tasks as below **(18 Months Completion Period)**:

Task-I Inception Report (2nd Months)

Task-II	Project Planning Report (12th Month)
Task-III	Separate PC-I for the subcomponent Land Acquisition/Resettlement (12th Month)
Task-IV	Draft Detailed Engineering Design, Draft Tender Documents& Draft PC-I.(15th Month)
Task-V	Final Detailed Engineering Design, Final Tender Documents & Final PC-I of the whole project.(18th Month)

TASK-I INCEPTION REPORT

Task-I will cover review of all existing survey/field investigations, feasibility reportsanddocuments available withIrrigation Department, Khyber Pakhtunkhwa.The Consultants will also review preliminary design of various components given in the reports and various studies, evaluate project benefits and cost considering the time of Implementation. Based on the findings of the review and additional work done by Consultants, the **Inception Report** will be prepared discussing alternate project layouts, area to be irrigated/ benefited, water availability/ requirement, seismotectonic study including infrastructure for implementation and operation of Bara Dam Multipurpose Project. The report will also include: the detail of field investigations/ survey/studies required for accomplishing the assignment, social and environmental impact assessment, staffing status, detailed work program for the Study and any other findings/ recommendations for review and concurrence by the Client, giving particular attention to water benefits in terms of power and Irrigation Department, Khyber Pakhtunkhwa.

TASK-II PROJECT PLANNING REPORT

The following services to be performed on the basis of Task-Ishall be covered under the Task - II.

a. In order to support the conclusions under Task-I, additional field survey/investigations will be conducted under the supervision of Consultants.

b. Project layout, for different canal alignments, locations of embankments/structures, intakestructuresshall be developed to the degree of detail necessary to provide a fair comparison between the alternates.

c. Review of available data and produce comprehensive studies, which may comprise but not limited to the following:

- Evaluation of existing downstream water rights with future projections.
- To workout crop water requirements based on appropriate cropping pattern keeping in view the existing farming practices over the respective/contagious command area.
- To study possibility of feeding Warsak Lift canal system in term of Hydrology & topography from the proposed reservoir.
- To chalk out most optimum alignment of water courses based on the respective Engineering/Revenue Chakbandi.
- Complete analysis of potential impact on water table in the adjoining area and its implications on the fertility of irrigated agriculture

- The latest research substantiates that in the post dam scenario the downstream river bed will get substantially incised and as such it is prudent to analyze its possible impact on the existing structures and off taking facilities on the downstream side of the proposed dam if any.
- To propose specific treatment (based on geo – technical investigation to the rock in contact with the fill at the abutment, foundation and in the reservoir area to avoid failure due to leakage at the contact points.
- To examine the option of gated spillway and its capability to eject reasonable sediment load amid high flood that may enhance the dam's useful life.
- Similarly, to estimate the sediment contents/load to be drawn by the dependent/ off taking irrigation network.
- Complete Chemo – Physical analysis of the incoming sediments and its impact on mechanical components with recommendation for appropriate remedial measures.
- To study the efficacy of sediment flushing facility already proposed and to frame appropriate Standard Operating Procedure (SOP) for its optimal operation

- Geological and Geotechnical Studies;
- Hydrological data collection studies;
- Neo &Seism tectonic Studies;
- Seismic Risk Analysis;
- Layout Plan and Optimization of Project Components / features;
- Design of Main Dam, Dyke, Spillway, Canal System & other Appurtenant Structures;
- Hydropower Development Studies including Power generation &Evacuation Plan;
- Soil and Agriculture Studies;
- Drinking Water Supply, Ground Water Recharge, Fisheries Development Studies;
- Development / Updating of Irrigation Department, Khyber Pakhtunkhwa System and Associated Structures;
- Socio-Economic Studies;
- Environmental Impact Assessment (EIA) with Environment Management Plan (EMP) and Social Impact Assessment (SIA) with Resettlement Action Plan (RAP);
- Construction Planning & Contract Packaging; and
- Financial and Economic Analysis with and without CDM.

d. Seismic risk evaluation to determine seismic design parameters for various project components. Disaster Risk during the Project implementation will be evaluated and mitigation measures be proposed as presented in "Checklist for Disaster Risk Reduction" (**Attachment-A**).

e. The population resettlement and the environmental aspects of the project will be assessed (reassessed in case of priority (ii), Task-I) and quantified. The costs and benefits of resettlement and environmental aspects shall be taken into consideration in assessing the economic and financial viability of the Project. For the economic feasibility, all costs and benefits shall be valued in economic terms, while for the financial feasibility, shall be expressed in financial terms.

f. Preparation of detail Engineering/Revenue Chakbandi/warabandi for irrigation system.

g. Submission of complete design calculations & backup data to client.

h. Keep/study provision of future raising of Dam if possible/required.

i. Tocomplete land acquisition process for the project as per client instructions/requirements

j. Consultants shall present their conclusions and recommendations to the above effects, in the shape of **Project Planning Report**, for review and concurrence by the Client.

Guidelines

a. Consultants will follow the given design standards:

- For Materials testing ASTM
- For Structures AASHTO, ACI & AISC, ASC Manual of RCC Conferences on R.C.C. Dam/ECRD.
- For Seismic design ACI / AASHTO code with latest Seismic Zoning Map for Pakistan.

b. Consultants shall proceed with the work, to determine and firm up the technical, economic and financial feasibility of the selected layout of the Project.

c. Activities to follow this will include, but not limited to;

i. Preparation of projectlayout covering all the components of the Project including the layout of infrastructure facilities required for implementation and operation stage of the Project.

ii. Preparation of Project Planning level designs of all structures for the selected alternate, and the components of the Project;layout of each major structure; and sufficient cross-sections to establish the magnitude and characteristics of the work and their construction costs, excluding infrastructure facilities.

iii. For purpose of estimating project cost, all unit prices for major quantities of work shall be established by the latest methods. These methods will simulate each construction activity in such a way as to fit it into the available time span in the proposed construction schedule. Construction equipment, crews, materials and other resources would be adjusted to accomplish the work within the required time-span. The computations of unit prices shall be supported by detailed sets of financial prices with source.

iv. Indirect cost of construction for all major items into which the construction work is subdivided for cost estimating purposes, should be established separately. Total cost of each construction item shall then be obtained by multiplying the direct cost of construction, by a bid factor representing the influence of indirect costs.

v. Preparation of cost estimates of the Project broken down into local and foreign components. These shall include:

- Major items like electro-mechanical and civil works including power house, main dam, dyke, spillway, intake & outfall structures etc. Price of major civil works and permanent equipment shall be estimated on the basis of ICB.
- Environmental Impact Assessment with Environmental Management Plan & Social Impact Assessment with Resettlement Action Plan with cost estimationincluding Clean Development Mechanism (CDM).
- Project Engineering and Management expenses, the owner's overhead expenses, and an adequate allowance for physical contingencies.
- Import duties, taxes and interest during construction (to be assessed separately and not be included in the base cost estimates).

vi. Price escalation provisions shall be computed on the basis of the construction schedule for Local and Foreign Currency Components on the criteria followed by the Planning Commission, Government of Pakistan. These price escalation provisions shall not be included in the economic cost estimates and shall be used only for financial forecast and financial requirement purposes.

vii. Possibility of prospective project financing and implementation through different modes i.e., Private Sector/Public-Private Partnership (PPP) etc.

viii. Preparation of a construction schedule using CPM analysis and schedules for annual construction expenditures, both for Local and Foreign Currency Components, throughout the Construction period, as well as a schedule of annual expenditures for the Environmental Impact Assessment/ Resettlement Action Plan and other items which generally extend beyond the project commissioning.

ix. For the purpose of economic analysis, power and Irrigation Department, Khyber Pakhtunkhwa benefits of the Project shall be based on realistic assumptions as to their value and on alternate scenarios for use of water in the existing or new irrigated areas.Based on the Project benefits, Economic Internal Rate of Return (EIRR), Net Present Value (NPV) and Benefit Cost Ratio (BCR) will be worked out to indicate the economic justification of the proposed project.

x. The financial analysis will cover the envisaged power andIrrigation Department, Khyber Pakhtunkhwa benefits available from the Project.The analysis will be carried out to identify and quantify benefits and costs expressed in financial terms using indicators i.e. Financial Internal Rate of Return (FIRR), Net Present Value (NPV) and Benefit Cost Ratio (BCR) in both scenarios i.e. with or without CDM benefits.

xi. Consultant will analyze Risk and Sensitivity of the Project output.They will propose an appropriate model after recalculating project outcomes (NPV,EIRR) for different values of major variables and combinations of variables.

xii. Consultants will submit a Draft Project PlanningReports to be discussed in Irrigation Department, Khyber Pakhtunkhwafor their views/comments. After clearance, the final Project Planning Report will be issued.

d. Consultants shall present their conclusions and recommendations to the above effects, in the shape of **Project Planning Report**, for review and concurrence by the Client.

TASK-III LAND ACQUISITION PC-I & RESETTLEMENT PLAN

a. Preparation of detailed EIA Report as per Pakistan Environmental Protection Act & its approval from EPA Khyber Pakhtunkhwa.
b. Preparation of complete estimate of land under submergence & required for all appurtenant structures as per standard practice in merged area of Khyber Pakhtunkhwa. (Land Acquisition & Resettlement Plan)
c. Complete detail of infrastructure under submergence & resettlement plan.
d. Complete details of dislocation (if any) along with complete compensation plain.
e. Preparation of comprehensive environmental protection plain during construction phase.
f. Preparation of Separate PC-I for Land Acquisition during Design phase.

TASK-IV DRAFT DETAILED ENGINEERING DESIGN, TENDER DOCUMENTS &PC-I

a. Preparation of DraftDetailed Engineering Design of all structures of the selected alternate including the components of the Project as at Part-II above.Environmental Impact Assessment with Environmental Management Plan & Social Impact Assessment with Resettlement Action Plan, cost estimation will also be prepared underTask - III.
b. Preparation of detailed drawings of each structure and BOQ.
c. Preparation of tender drawings with sufficient details in respect of the above for International Competitive Bidding.
d. Preparation of tender documents in line with FIDIC, PEC, KPPRAWorld Bank, WAPDA guidelines and standard practice for donor funded projects. The tender documents shall cover the Civil /Electro-Mechanical works of the Project and its components.
e. Based on the Project Planning Report, Detailed Engineering Design, Tender Documents and PC-I will be framed as per the guidelines of Planning Commission of Pakistan. Tender documents for each contract package shall consist of the following volumes;

   Volume - I: Invitation to Bids, Instructions to Bidder, General Conditions and Special Conditions
   Volume - II: Technical Specifications
   Volume - III: Forms of Bid, BOQs, schedule of forms of Bank Guarantee for Bid Security, Performance Security and advance mobilization loan
   Volume - IV: Contract Drawings

f. Consultants will submit a Draft Detailed Engineering Design, EIA, SIA, EMP& RAP Reports, Tender Documents and PC-I to be discussed withIrrigation Department & other stake holders for their views / comments. After clearance, the final Reports will be issued.

TASK - V FINAL DETAILED ENGINEERING DESIGN, TENDER DOCUMENTS & PC-I

Final Detailed Engineering Design report will be submitted after attending the entire comments from the Departments and Implementation of suggestions/ changes as per third party validation of the study.

2. REPORTING AND DOCUMENTATION

This will, inter-alia, cover the following:

a. Submission of Inception Report within first two (02) months of receiving notice to proceed from the Client (Draft: 10 copies; Final: 20 copies).

b. Submission of regular monthly progress reports of implementation progress and financial status summarizing problem areas, proposed modifications and future action for the Client's use (20 copies).

c. Preparation of special reports/ memoranda to elicit Client's consent / approval on specific issues (20 copies).

d. Submission of Project Planning Report within first Twelve (12) months of the Project to enable Client's concurrence (Draft: 10 copies; Final: 20 copies).

e. Submission of comprehensive land acquisition PC-I for approval of competent forum.

f. Submission of Detailed Engineering Designs, EIA, SIA, EMP& RAP Reports,Quality Assurance / Quality Control Manual& Tender Documents. (Draft: 15 copies; Final: 50 copies).

g. Submission of PC-I Proforma (Draft: 20 copies; Final: As required by Approving forums i-e PDWP, CDWP, ECNEC, NEC).

   i. Consultants will complete the assignment and submit all documents within a period of Eighteen (18) months from the date of commencement.

   ii. All submissions including software's purchased during the Study, spreadsheets with formulae, reports & mapsshall be provided in editable formatto the Client along with Compact Discs (CDs)/ flash drivefor future reproduction on the same format on which reports/ maps etc. are prepared (05 sets).

g. Third Party Validation Report (10 Copies)

3. STAFF INPUTS (CONSULTANTS)

The following provisions are available for the engineering study of the Project.

- Man-months inputs of technical/support staff are given below.
- Foreign technical input is at liberty of consultant.

Key personnel's required qualifications& experience is attached (**Attachment-B**).

4. THREETRAINING SECESSIONS OF IRRIGATION DEPARTMENT, KHYBER PAKHTUNKHWA KPK STAFF

Consultants shall arrange 03 times on job training session on design of Dams & HPPforIrrigation Department, Khyber Pakhtunkhwa/Bara Dam Project Staff, to be nominated by PD Bara dam. (8 persons in each session)

5. ADDITIONAL SERVICES

Regarding any services additional to those specified above, Consultants, if specifically requested by Irrigation Department, Khyber Pakhtunkhwa KPK, shall;

Provide specialist technical advice on aspects of the works that are not normally required / provided during the studies. However, any services which are not specifically mentioned in the TOR abovebut are allied and essential for the effective implementation and completion of the Project will also be provided by Consultants and will be deemed to have been part of this TOR.

6. RESOURCES

The client shall not provide any manpower logistic support in terms of technical or non-technical support staff, surveys, geotechnical investigations, transportation and traveling accommodation, office space, equipment, printing, courier and utilities etc. The Consultants should accordingly include cost of all the above and that of any other items(s)that the Consultants consider necessary for the project execution. However, the Client reserves the right to nominate the Engineering staff to sit with Consultant to acquaint them with the design process.

Following are the key positions along with estimated man-months, Qualification and experience of the personnel are also given below. Man-months for technical Support (non-key) staff have also proposed but the same shall not be considered in the evaluation of technical proposal.

6.1 KEY STAFF FOR DETAILED ENGINEERING DESIGN, PREPARATION OF TENDER DOCUMENTS & PC-I

Study Period = 24 Months

Sr. No	Description	Man Month
1	Project Manager / Team Leader	18
2	Expert (Geotechnical)	10
3	Expert (Hydrology and Sedimentation)	10
4	Expert (Electrical / Mechanical)	12
5	Expert (Hydraulic Design)	8
6	Expert (Dam Design)	8
7	Expert (Structure Design)	8
8	Expert (Environment)	6
9	Expert (Resettlement)	6
10	Expert (Construction Planning)	8
11	Principal Geologist	8
12	Principle Electrical / Mechanical Engineer with SCADA specialization	8
13	Principal Hydropower Engineer	06
14	Principal Contract Engineer	06
15	Principal Economist/Statistician	10
16	Principal Sociologist	6
17	Principal Statistician	06
18	Senior Engineers / Surveyor / Costing Engineer	06
19	Geotechnical Engineer	18
20	Social Organizer(s)	54
21	Jr. Engineers (Geotech)/ Jr. Geologists	24
22	Jr. Engineer (Elect/Mech/ Jr. Sociologist / Seismologist)	24
23	AutoCAD Operators	40
24	RetdZillladar	12
25	RetdPatwaries	24
26	Apprentice Engineer (Civil)	36
Personnel will be employed with due consent of client		

& as per requirement of study. Similarly non key staff/support staff will be hired with prior approval of client	

6.2 CONSULTANT'S COST (OTHERS)

Sr. No		Item	Unit	Qty
	PROJECT OFFICE (PO)			
A	**Furnished accommodation with air conditioning**			
	1	Office rent	Month	18
	2	Air conditioners (Invertor Split Type)	No.	4
	3	Heaters (Electric)	No.	4
		Office furniture		
	4	Office Table 6'x4'	No.	4
	5	Office Table 5'x3'	No.	8
	6	Office Desks	No.	10
	7	Revolving office chairs	No.	5
	8	Office chairs	No.	15
	9	Side Racks	No.	5
	10	Filing cabinets	No.	4
	11	Computer tables with chairs	No.	6
	12	Conference table	No	01
		Subtotal - A		
B	**Electricity, water and gas charges**			
	1	Electricity, water and gas charges.	Month	18
		Subtotal - B		
C	**Office equipment**			
	1	Latest computers/laptop with accessories and UPS etc.	No.	10
	2	Laser printer (A3 size) colour	No.	1
	3	Laser printer (A4 size)	No.	3
	4	Drone Camera/DSLR	No.	2
	5	Photocopy machine heavy duty	No.	1
	6	Networking of computers	Job	1
	7	Internet connections	Job	1
	8	Fax machine	No.	1
	9	Scanner (A3 size)	No.	1
	10	Refrigerator	No.	1

	11	Water dispenser	No.	1
	12	LED for Presentations	Job	02
		Subtotal - C		
D	**Office supplies and stationery**			
	1	Office supplies & stationery	Month	18
	2	Plain paper for drawings	Job	1
	3	Photocopying paper packets	Job	1
	4	Computer stationery, toner, USB memory, CD, spares etc.	Month	18
		Subtotal - D		
E	**Printing and binding of reports**			
	1	Printing & binding of reports	Job	1
		Subtotal - E		
F	**Telex, postage, courier and telephone charges**			
	1	Telephone calls & internet	Month	18
	2	Fax	Month	18
	3	Postage/ Couriers	Month	18
		Subtotal - F		
G	**Transport including running and maintenance. (Vehicles will be purchased from authorized Toyota dealer. Will be paid as per actual invoice& will be registered on the name of client. One vehicle will be specifically for client use) Client also reserve the right to withdraw/replace vehicles**			
	1	Toyota Double cabin 4WD	Qty	4
	2	Toyota Double cabin 4WDwith Marks Conversion (Full Body)	Qty	1
	3	POL & Maintenance	Month	90
		Subtotal - G		
H	**Non-technical / Work charged staff**			
	1	Office Manager	Month	18
	2	Accounts officer	Month	18
	4	Naib qasid (02 Nos.)	Month	36
	5	Chowkidar (02 Nos.)	Month	36
	8	Driver (02 Nos.)	Month	36

		Subtotal - H		**264**
I	**Software / Literature / Data**			
	1	Software/ Programs	Job	1
	2	Books / Journals / Magazines etc.	Month	18
		Subtotal –I		
	FIELD OFFICE (FO)			
J	**Furnished accommodation**			
	1	Rent for site office	Month	12
		Office/Hostel Furniture		
	2	Office table 5'x3'	No.	2
	3	Office desks	No.	4
	4	Office chairs	No.	8
		Subtotal –J		
H	**Electricity, water and gas charges**			
	1	Electricity, water and gas, etc.	Month	12
		Subtotal –H		
				Continued…
L	**Office equipment**			
	1	Latest computers with accessories and UPS etc.	No.	1
	2	Laser printer (A4 size)	No.	1
	3	Fax machine	No.	1
		Subtotal - L		
M	**Office supplies and stationery**			
	1	Office supplies & stationery	Month	12
	2	Computer stationery, toner, USB memory, CD, spares etc.	Month	12
		Subtotal - M		

Note: Furniture/equipment's will be paid as per actual & all movable property will be returned to client at completion of study.

6.3 SURVEY, INVESTIGATIONS & DATA COLLECTION

6.3.1TOPOGRAPHIC SURVEY AND MAPPING

Sr. No.	Description	Qty.*	Unit	Rate** (Rs.)	Amount (Rs. in million)
	Topographic and cadastral survey for head works/Dams & other irrigation projects by using Total station GPS, etc. with minimum 30 number of point reading per acre, to generate 15mx15m grid and 0.5 m interval contours including transfer of entire data to computer system in different geo-referenced layers / themes using features of standard software, compatible with design software packages, including supply of soft and hard copies of point readings, including digitizing village maps and super imposing the contours on village map (scale 1in 4000) including marking all permanent features like roads, cart tracks, existing canals, mosques, tanks, forest boundary and electric poles, etc. including marking of ridges and valleys on survey sheet including supply of 4 soft copies and 4 hard copies after approval of competent authority, preparation & submission of grid and L-section nalla etc. complete, Video Documentary, Drone verification of Survey.				
1	Reservoir	1,875	100 acres		
2	Detailed topographic survey of dam site, spillway, borrow area, power house, dykes and other structure along with digitization.	375	acres		
3	Strip survey 100 m wide on both sides of tunnel, main canal alignment and drinking water supply line along with digitization.	2500	acres		
4	Command Area	43,000	acres		
5	Traversing and Precise leveling from B.Ms for establishing survey datum at dam site (fore and back).	2500	acres		
6	Longitudinal profile & cross-sections of nullahs.	25	No.		
7	Construction of permanent B.Ms at various sites.	25	No.		
				Total	

6.3.2 GEOLOGICAL AND GEOTECHNICAL INVESTIGATIONS

Sr. No.	Description	Qty.*	Unit	Rate (Rs.)	Amount (Rs. in million)
1	**Drilling by diamond drilling, holes of minimum 75 mm dia. vertical or at specified inclination using diamond core drilling bit, double barrel tube in masonry, concrete or rock including cost of all materials, machinery, labour, water, collection of core samples, logging & labelling samples, supplying wooden core box and re-drilling in case of collapse of sides etc. complete. excluding cost of mobilization & demobilization. (For depth 0 to 50 m and inclined at 0o to 10o vertically downward) i/c Geophysical Study (ERT).**				
	A. Dam axis				
	a. Abutments: 04 boreholes each of 100 m depth.	400	m		
	b. River Bed: 03 boreholes each of 75 m depth.	225	m		
	B. Spillway				
	04 boreholes each of 50 m depth on intake, chute & silting basin.	200	m		
	C. Power House				
	04 boreholes each of 25 m depth.	100	m		
	D. Diversion Tunnels, Low Level Outlets & Power Tunnels				
	12 boreholes each of 25 m depth.	300	m		
	Subtotal	**1,225**	**m**		
2	**Test Pits**				
	35 Nos. test pits in structure, borrow areas (3 m x 3 m x 3 m).	945	m^3		
3	Geo-physical Seismic Refraction Survey.	2,000	m		
4	Exploratory Adits (02 Nos. each of 25 m x 2.25 m x 2.25 m).	253	m^3		
5	Geological Mapping of reservoir & dam structure areas.	900	hectare		
6	Laboratory testing for core drilling and test pits (sieve analysis, hydrometer, specific gravity / absorption, unit weight analysis, organic impurities, sodium sulphate, soundness, petro graphic analysis, porosity, permeability, direct shear, unconfined compression strength, slake durability, sonic velocity and proctor test etc.).	1	Job		
				Total	

6.3.3 HYDROLOGICAL DATA COLLECTION

Sr. No.	Description	Qty	Unit	Rate (Rs.)	Amount (Rs. in million)
1	Procurement & Installation of Stage Gauges & Procurement of Sediment Samplers	1	Job		
2	Automation of Gauges, Networking & Tramission of Data	1	Job		
3	Hydrographer (1 No.), Automatic Weather Station.	24	Man - Month		
4	Gauge observer (3 Nos.)	72	Man - Month		
5	Sounding Attendant (1 No.)	24	Man - Month		
6	TA / DA	24	Month		
7	Stock & misc. items	24	Month		
				Total	

6.3.4HYDRAULIC MODEL STUDIES

Sr. No.	Description	Amount** (Rs. in million)
1	Hydraulic Model Studies of the project	
(a)	-Numerical/Mathematical modeling of project component	
(b)	- Physical model study from irrigation research institute Punjab nandipur for whole project component	
S	**Total**	

7. QUALIFICATIONS AND EXPERIENCE OF CONSULTANT'S KEY PERSONNEL

Consultants key personnel should possess the qualifications and experience as mentioned below:

1. **Project Manager / Team Leader**

He/ She should at least be Master's Degree in Civil Engineering from a HEC / PEC recognized university. Ph.D. qualification in related engineering discipline shall be given additional weight age. The incumbent should have specific experience of working in senior techno-managerial position with at least 10 years as team leader on similar Projects. The incumbent should have minimum experience of 15 years with at least 8 years on similar assignments. The incumbent should be able to lead the team of Consultants and assist Irrigation Department in timely completion of the services with a quality output.

2. **Expert (Geotechnical)**

He/ She should have at least Master's Degree in Civil / Rock Mechanics / Geotechnical Engineering from a HEC / PEC recognized university. Ph.D. qualification in related disciplines will be given additional weightage. The incumbent should have at least 15years' overall experience with minimum of 10 years in geotechnical discipline. The incumbent should have at least 7 years of working experience as Expert (Geotechnical).

3. **Expert (Hydrology & Sedimentation)**

He/ She should have at least Master's Degree in Civil / Hydrology or Water Resources Engineering from a HEC/ PEC recognized university. Ph.D. qualification in related disciplines will be given additional weightage. The incumbent should have at least 15years overall experience with minimum of 10 years in tunneling. The incumbent should have at least 7 years of working experience as Expert (Tunneling).

4. **Expert (Electrical / Mechanical)**

He/ She should have at least Master's Degree in Electrical/ Mechanical Engineering from a HEC / PEC recognized university. Ph.D. qualification in related disciplines will be given additional weightage. The incumbent should have at least 15years overall experience with minimum of 10 years on the similar projects / assignments. The incumbent should have at least 7 years of working experience as Expert (Electro-Mechanical).

5. **Expert (Hydraulic Design)**

He/ She should have at least Master's Degree in Hydraulic / Water Resource Engineering from a HEC / PEC recognized university. Ph.D. qualification in related disciplines will be given additional weightage. The incumbent should have at least 20 years overall experience with minimum of 15 years on the similar projects / assignments. The incumbent should have at least 7 years of working experience as Expert (Hydraulic Design).

6. **Expert (Dam Design)**

He/ She should have at least Master's Degree in Civil / Dam or Geotechnical Engineering from a HEC / PEC recognized university. Ph.D. qualification in related disciplines will be given additional weightage. The incumbent should have at least 15years overall experience with minimum of 10 years on the similar projects / assignments. The incumbent should have at least 7 years of working experience as Expert (Dam Design).

7. **Expert (Structure Design)**

He/ She should have at least Master's Degree in related engineering discipline from a HEC / PEC recognized university. Ph.D. qualification in related disciplines will be given additional weightage. The incumbent should have at least 15years overall experience with minimum of 10 years on the similar projects / assignments. The incumbent should have at least 7 years of working experience as Expert (Structure Design).

8. **Expert (Environment)**

He/ She should have Master's Degree in Environmental Engineering/ Environmental Sciences from a HEC/ PEC recognized university. Ph.D. qualification in related disciplines will be given additional weightage. The incumbent should have at least overall experience of 15 years with 10 years working on similar assignments / projects. The incumbent should have at least 7 years of working experience as Expert (Environment).

9. **Expert (Resettlement)**

He/ She should have Master's Degree in Social Sciences from a HEC/ PEC recognized university. Ph.D. qualification in related disciplines will be given additional weightage. The incumbent should have at least overall experience of 15 years with 10 years working on similar assignments / projects. The incumbent should have at least 7 years of working experience as Expert (Resettlement).

10. **Expert (Construction Planning)**

He/ She should have Master's Degree in Civil Engineering from a HEC / PEC recognized university. Ph.D. qualification in related disciplines will be given additional weightage. The incumbent should have at least 15years overall experience with minimum of 10 years' experience in Construction Planning assignments. The incumbent should have at least 7 years of working experience as Expert (Construction Planning).

11. **Principal Geologist**

He/ She should have Master's Degree in Geology / Rock Mechanics from a recognized university. Higher qualification in related disciplines will be given additional weightage. The incumbent should have at least 15years overall experience with minimum of 10 years' experience in related assignments.

12. **Principal Electrical / Mechanical Engineer**

He/ She should have Master's Degree in Electrical (with SCADA)/ Mechanical Engineering from a recognized university. Higher qualification in related disciplines will be given additional weightage. The incumbent should have at least 15years' overall experience with minimum of 10 years' experience in related assignments.

13. **Principal Structure Design Engineer**

He/ She should have Master's Degree in Civil Engineering / Structural Engineering from a recognized university. Higher qualification in related disciplines will be given additional weightage. The incumbent should have at least 15years' overall experience with minimum of 10 years' experience in Hydro-Mechanical assignments.

14. **Principal Reports / Documentation Engineer**

He/ She should have at least Master Degree in Civil Engineering from a recognized university. Higher qualification in related disciplines will be given additional weightage. The incumbent should have at least 15years overall experience with minimum of 10 years in related discipline.

15. **Principal Contract Engineer**

He/ She should have at least Master's Degree in Civil Engineering / Contract Management from a recognized university. Higher qualification in related disciplines will be given additional weightage. The incumbent should have at least 15years' overall experience with minimum of 10 years in related discipline.

16. **Principal Economist/Statistician**

He/ She should have at least Master's Degree in Economics or statistics from a recognized university. Higher qualification in related disciplines will be given additional weightage. The incumbent should have at least overall experience of 15 years with minimum 10years exposure to financial analysis / evaluation /projects monitoring in public sector.

17. **Principal Sociologist**

He/ She should have at least Master's Degree in Sociology from a recognized university. Higher qualification in related disciplines will be given additional weightage. The incumbent should have at least overall experience of 15 years with minimum 10years' exposure on similar projects.

18. **Principal Hydropower Engineer**

He/ She should have Master's Degree in Hydropower Engineering from a recognized university. Higher qualification in related disciplines will be given additional weightage. The incumbent should have at least 15 years' overall experience with minimum of 10 years' experience in related assignments.

19. **Geo Technical Engineer**

He/ She should have Master's Degree in Civil Engineering (Geo Technical Engg) from HEC recognized University. The incumbent should have at least three (03) years' experience of working with international consultant on irrigation projects.

8. EVALUATION CRITERIA OF PROPOSALS

Proposals of the consultancy firms will be evaluated as under

S.No	Description	Maximum Marks
A	Qualification & Experience of Technical Key Personnel	50
B	Experience of firm in undertaking Projects of dam & Hydraulic structures of similar nature & complexity	30
C	Work Plan/Manning Schedule & Methodology	20
	Total	**100**

Note.

- Each page of the proposal must be numbered, sealed & signed by the owner of firm
- Passing marks in each category will be 60%
- Proposals must be stippled bided. Ring binding will not be considered.
- Client reserves the right to make any change in TORs & marking criteria which is commonly applicable to all proposals
- Any observation/clarification required should be brought in notice of the Client / Employer before submission of the proposal during clarification meeting.
- Proposals shall be submitted in two copies (Marked as Original & Copy)

- Any mis-statement or false information provided in the technical or financial proposal will render the proposal as non-responsive and shall make the firm liable for punitive action under the relevant rules.

A. Qualification & Experience of Technical Key Personnel

ii. Marking criteria of Personnel

S.No	Description	Marks	Criteria
1	Qualification	20	As described against each Descipline
2	Languages	05	Pashto=2 (R W S) Urdu=1.5 (R W S) English=1.5 (R W S)
3	Experience	30	
	General Experience	7.5	Experience after completion of 16 Years education
	Relevant Experience	15	Experience of particular discipline
	Similar (DAM/Hydropower) Projects	7.5	Full marks for 5 Dams & 5 Hydropower Projects
4	Experience of Local Environment	05	Khyber Pakhtunkhwa=03 Pakistan=02
	Total	**60**	**Will be adjusted to 50**

iii. This proforma must be available on top of each CV in addition to the information to be provided as per standard format of KPPRA /PEC, otherwise will not be considered.

1	2	3	4	5	6		
S#	Position	Proposed Personnel	Qualification	Knowledge of Languages	Experience		
					General	Relevant	Dam Projects
7	8	9					
Working Environment/Location	Cell No	Duration with firm					

Note.

- The proposals must contain salary details, last degree, PEC registration certificates of the key staff
- Each CV must be signed in Original by the Personnel & owner of the firm.
- Personnel above the age of 70 will be in eligible

B. EXPERIENCE OF FIRM.

S.No	Description	Maximum Marks
1	Relevant/Specific Experience of Firm (Completed/In progress Dam/Hydropower Projects in last 15 Years)	20 Feasibility Study= 25% marks, Detailed Design= 40% Marks, Procurement= 10% Marks Construction supervision= 25% Total= 100%
2	General Experience of Firm (Any	10

	completed Project of Hydraulic Structures in last 10 Years)	Feasibility Study= 25% marks, Detailed Design= 40% Marks, Procurement= 10% Marks Construction supervision= 25% Total= 100%

Note

- Consultancy services of five (05) Dam Projects with cost not less than Rs 2000 million (Construction Cost) and 05 Hydropower Project not less than 06 MW entitle the firm for full marks in Specific experience category.
- Consultancy service of the project in relevant experience less than 2000 million will not be considered.
- Consultancy Services of the Projects in general experience category with cost less than Rs 2500 million will not be considered.
- **Award & completion documents** must be available in support of projects claimed as experience
- Below proforma must be attached for any projects of sr No 1& 2 in addition to standard format.

1	2	3	4	5	6	7
S#	Name of Project	Location with Province & Country	Client	Address, Phone & Fax No of Client	Handled as: • Single Firm/ : • Lead Firm/ : • Joint Venture : Partner	Cost of Project
8	9	10		11		
Cost of Services	Scope of services • Feasibility • Detailed design • Procurement • Construction Supervision	Scope of Work				

UNDERTAKING

It is hereby certified that the above are true statements based on facts and we take full responsibility for the correctness and accuracy of the information supplied herein to the best of our knowledge and belief. This is also to certify that the owner/partners/directors working solely for the consulting engineering profession. This is further to certify that we are independent consulting engineer and have no interest in any construction and conflicting commercial industrial and business activities which are likely to influence our professional independence and neutrality. We also undertake to fully abide by KPPRA act/rules & the Pakistan Engineering Council (Conduct and Practice of Consulting Engineers) Byelaws 1986 & registered with Khyber Pakhtunkhwa Revenue Authority

9. MODE OF PAYMENT. Mode of Payment will be on deliverables as per given details excluding cost of investigation from total approved cost, which will be paid as per actual.

S#	Description/Activity	%age payment of approved Cost
1	Upon Signing of Contract & establishment of offices	10%
2	Upon Submission of review report	10%
3	Upon Submission of Inception report	10%
4	Submission of Project Planning Report	10%
5	Submission of Land Acquisition PC-I	10%
6	Submission of LARP	5%
7	Submission of In term Design Report	5%
8	Submission of Draft Design Report,	10%
9	Submission of Draft bidding documents & Draft PC-I	10%
10	Submission of Final Design Report,	10%
11	Submission of final bidding documents & final PC-I	10%