

**Alternative Energy Promotion Centre (AEPC)
Renewable Energy for Rural Livelihood (RERL)**

REQUEST FOR PROPOSAL FOR CONSULTING SERVICES

RFP No. RERL/03/2019

for

"Technical Feasibility Study and Detailed Engineering Design of Solar Irrigation and Solar Drinking Water Projects and Site Supervision and Monitoring during construction for Belhi Integrated Rural Development Project (BIRD-DWIP)"

Project Name : Renewable Energy for Rural Livelihood (RERL)

Office Name : Alternative Energy Promotion Centre (AEPC)

Office Address : Khumaltar Height, Lalitpur, Nepal

Financing Agency: RERL

Date of RFP Issue: 4 April 2019

Deadline for Submission of RFP: 18 April 2019

Date.....

Dear Sir/Madam

Subject: Preparation of "Technical Feasibility Study and Detailed Engineering Design of Solar Irrigation and Solar Drinking Water Projects and Site Supervision and Monitoring during construction for Belhi Integrated Rural Development Project (BIRD-DWIP)"

Please study the evaluation criteria and provide the relevant information

To enable you to submit a proposal, attached are:

- i. Instruction to OfferorAnnex I
- ii. General Terms and Conditions of the ContractAnnex II
- iii. Proposal Submission FormAnnex III
- iv. Financial Proposal Submission Form.....Annex IV
- v. Terms of Reference (TOR).....Annex V

Your offer comprising of both a technical proposal and a financial proposal, in a separate sealed envelopes, should reach the following address no later than **18 April 2019**

The National Programme Manager
Renewable Energy for Rural Livelihood (RERL)
Khumaltar Height, Lalitpur, Nepal
Phone: 01 5539390, 5539391, Fax: 01 5542397
Website: <http://www.aepc.gov.np/rerl/>
Email: info.rerl@aepc.gov.np

If you required additional information, we are ready to provide information, but any delay in providing such information will not be considered a reason for extending the submission date of your proposal.

Yours sincerely,

Mr. Satish Gautam
National Programme Manager(NPM)

A. Introduction

1. General

The purpose of this RFP is to invite technical and financial proposals from the potential consulting firms who have skill, knowledge and expertise for Preparation of "**Technical Feasibility Study and Detailed Engineering Design of Solar Irrigation and Solar Drinking Water Projects and Site Supervision and Monitoring during construction for Belhi Integrated Rural Development Project (BIRD-DWIP)**"

2. Cost of Proposal

The offeror shall bear all costs incurred during submitting the proposal. The offeror shall bear all costs associated with the preparation and submission of the proposal. RERL will in no case be responsible or liable for those costs, regardless, of the conduct or outcome of the evaluation of this proposal.

B. Solicitation Documents

3. Contents of solicitation documents

Proposals must offer services for total requirement. The Offeror is expected to examine all corresponding instructions; forms, terms and specifications contained in the solicitation Documents. Failure to comply with these documents will be at the offeror's risk and may affect the evaluation of the Proposal.

4. Clarification of solicitation documents

The offerors requiring any clarification of the Solicitation Documents can forward their queries in the following email address

Email: info.rerl@aepec.gov.np

5. Amendment of solicitation documents

At any time prior to the deadline for submission of proposals, the RERL may, for any reason, whether at its own initiative or in response to a clarification requested by a shortlisted Offeror, modify the Solicitation Documents by amendment.

All offerors that have received the Solicitation Documents will be notified in writing of all amendments to the Solicitation Documents. In order to afford prospective Offerors reasonable time in which to take the amendments into account in preparing their offers, RERL will notify in time.

C. Preparation of Proposals

6. Applying for providing services

The Offerors need to read the RFP including the ToR and prepare proposal accordingly. The proposal must address all the requirements of the proposal including required documents.

7. Language of the proposal

The proposal prepared by the Offeror and all correspondence and documents relating to the proposal exchanged by the Offeror and the RERL shall be written in the English language.

8. Documents comprising the proposal

The proposal shall comprise the following **mandatory documents**:

- a. Proposal submission form
- b. Organizational Profile/Brochure—describing the nature of business, field of experience, licenses, certification and accreditations
- c. Valid registration and renewal certificate
- d. VAT certificate
- e. Tax Clearance Certificate of 2074/75
- f. Track records of Human resource- with list of similar services relevant to objective and scope of works included in this RFP.
- g. CVs of proposed human resources signed by concern individual
- h. The proposal must provide clear methodology to meet the activities proposed for completing this task

9. Proposal form

The Offeror shall structure the operational and technical part of its proposal as follows:

i. Proposed methodology

This section should demonstrate the Offeror's responsiveness to the specification by identifying the specific components proposed, addressing, the requirements, as specified, point by point, providing a detailed description of the essential performance characteristics proposed warranty; and demonstrating how the proposed methodology meets or exceeds the specifications. **This section should explain clearly how the required information as mentioned in the scope of work in the attached ToR will be collected and analyzed.**

Pricing information shall be separated and only contained in the appropriate Price Schedules.

It is mandatory that the Offeror's Proposal numbering system corresponds with the numbering system used in the body of this RFP. All the references to descriptive material and brochures should be included in the appropriate response paragraph, though material/documents themselves may be provided as annexes to the Proposal/response.

Information which the Offeror considers proprietary, if any, should be clearly marked "proprietary" next to the relevant part of the text and it will then be treated as such accordingly.

ii. Summary Sheet

The Offeror is required to prepare a summary sheet (Table 1) with information related to preparation of Technical Feasibility Study and Detailed Engineering Design of Solar Irrigation and Solar Drinking Water Projects and Site Supervision and Monitoring during construction for Belhi Integrated Rural Development Project (BIRD-DWIP)”

Table 1: Summary sheet

SN	Name of the program/project	Contract agency	Duration	Amount of contract

iii. Qualification of the Service Provider

The consulting firm (Offeror) must have at least 5 years of experience of designing civil components of renewable energy projects. Preference will be provided to the consulting firms with prior experience in preparing feasibility studies regarding integrated water supply Systems and irrigation system. The consulting firm must be legally registered as per the rule of Government of Nepal and provide the following documents

1. Company Registration Certificate
2. VAT Registration Certificate
3. Tax Clearance Certificate FY 2074/75

iv. Human Resource Requirement

To accomplish this assignment, the team (or consultant) should comprise of qualified and experienced professionals with the expertise listed below. Individual professionals may hold multiple competencies within the required scope of expertises.

Irrigation and drinking water system expertise (Civil Engineering Expert):

- Minimum of three (5) years' experience in irrigation and drinking water projects in Nepal or overseas and must have a minimum of bachelor's degree in Civil Engineering;
- Have in-depth knowledge on the synergy of water availability, irrigation and agriculture, including micro irrigation and must have experience in designing drinking water project, experience in the terai will be added advantage.
- Have in-depth knowledge of structural design of civil structure of solar mounting structure, over-head tanks, distribution tank, piping system etc.
- Practical experience in rural community engagement

- Experience in the field of management.

10. Proposal prices

The Offeror shall indicate on an appropriate Price Schedules, the price of a service it proposes to supply under the contract. The VAT should be included in the offer, if applicable. The tax will be deducted at source as per prevailing tax rule of the government.

11. Proposal currencies

All prices shall be quoted in the Nepalese Rupees (NRs).

12. Period of validity of proposals

Proposals shall remain valid for One Hundred And twenty (120) days after the date of the Proposal submission prescribed by the RERL, pursuant to the deadline clause. A Proposal valid for a shorter period may be rejected by RERL on the grounds that it is non-responsive.

In exceptional circumstances, the RERL may solicit the Offeror's consent to an extension of the period of validity. The request and the responses there to shall be made in writing. An Offeror granting the request will not be required or permitted to modify its proposal.

13. Format and signing of Proposals

The Offeror shall prepare the Proposal. The Proposal shall be in typed or written in indelible ink and shall be signed by the Offeror or a person or persons duly authorized to bind the Offeror to the contract. The latter authorization shall be indicated by written power-of-attorney accompanying the proposal.

The Proposal shall contain no interlineation, erasures, or overwriting except, as necessary to correct errors made by the Offeror, in which case such corrections shall be initialed by the person or persons signing the proposal.

14. Estimated Completion Date

The desired delivery date for completion of this task is 3 months after signing the contract.

15. Terms of Payment and Deliverables

a. Payment The RERL shall effect payments to the Contractor/Offeror after acceptance by the RERL of the invoices submitted by the Contractor/Offeror. The payments will be made in installment basis based on deliverables.

Amount in percentage

Payment

- | | |
|---------|---|
| i) 20% | After submission of inception report. |
| ii) 50% | After Completion of Design of Irrigation and Drinking Water |

- Components.
- ii) 30% After completion of monitoring and supervision of installation of drinking water and irrigation project and submission of final report having approval from concerned authority of AEPC/RERL

The above payment plan shall apply GON and UNDP NIM guideline.

b. Deliverable (output)

The followings will be suggested outputs of the assignment:

Draft report - soft copy within 2 month of contract signing

Final report of irrigation and drinking water project- soft copy within 3 months of contract signing.

Final report- 3 copies in hard and soft copy within 8 month of contract signing.

D. Submission of Proposals

16. Sealing and marking of Proposals

The Offeror shall seal (labeled) the proposal in one outer and two inner envelopes, as detailed below.

- (i) The outer envelope shall be

Addressed to:

The National Project Manager

Renewable Energy for Rural Livelihood (RERL)

Khumaltar Height, Lalitpur, Nepal

Phone: 01 5539390, 5539391, Fax: 01 5542397

Website: <http://www.aepc.gov.np/rerl/>

Email: info.rerl@aepc.gov.np

And,

Marked with:

Preparation of " Technical Feasibility Study and Detailed Engineering Design of Solar Irrigation and Solar Drinking Water Projects and Site Supervision and Monitoring during construction for Belhi Integrated Rural Development Project (BIRD-DWIP)"

- (ii) Both inner envelopes shall indicate the name and address of the Offeror. The first inner envelope shall contain the information specified in clause 8 (Proposal Form) above. The second inner envelope shall include the price schedule and price schedule of individual Offeror duly identified as such.

NOTE, if the inner envelopes are not sealed and marked as per the instructions in this clause, the RERL will not assume responsibility for the Proposal's misplacement or premature opening.

16. Deadline for the submission of Proposals

Proposals must be received by the RERL at the address specified under clause *Sealing and Marking of Proposals* no later than **17:00 hrs, 18 April 2019**.

RERL may, at its own discretion extend this deadline for the submission of Proposals by amending the solicitation documents in accordance with clause *Amendments of Solicitation Documents*, in which case all right and obligations of the RERL and Offerors previously subject to the deadline will thereafter be subject to the deadline as extended.

17. Late Proposals

Any Proposals received by RERL after the deadline for the submission of Proposals, pursuant to clause *Deadline for the submission of Proposals*, will be rejected.

18. Modification and withdrawal of the Proposals

The Offeror may withdraw its proposal after the Proposal's submission, provided that written notice of the withdrawal is received by the RERL prior to the deadline prescribed for the submission of the Proposals.

The Offeror's withdrawal notice shall be prepared, sealed, marked, and dispatched in accordance with the provisions of the Clause *Deadline for Submission of Proposals*. The withdrawal notice may also be sent by telex or fax but followed by a signed confirmation copy.

No proposal may be modified subsequent to the deadline for the submission of the Proposals.

No Proposal may be withdrawn in the interval between the deadline for submission of proposals and the expiration of the period of the Proposal validity specified by the Offeror on the Proposals Submission Form.

E. Opening and evaluation of the Proposals

19. Opening of proposals

The RERL will open the Proposals in the presence of AEPC and UNDP representatives at the Programme Office.

20. Clarification of the proposals

To assist in the evaluation and comparison of Proposals, the Purchaser may at its discretion, ask the Offeror for clarification of its Proposal. The request for clarification and the response shall be

written form and no change in price or substance of the Proposals shall be sought, offered or permitted.

21. Preliminary examination

The Procurer will examine the Proposals to determine whether they are complete, whether any computational errors have been made, whether the documents have been properly signed, and whether the Proposals are generally in order.

Arithmetical errors will be rectified on the following basis: If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price errors, its proposal will be rejected. If there is a discrepancy between the words and figures the amount in words will prevail.

Prior to the detailed evaluation, the Procurer will determine the substantial responsiveness of each Proposal to the request for Proposals (RFP). For the purposes of these clauses, a substantially responsive Proposal is one which confirms to all the terms and conditions of RFP without material deviations. The producer's determination of a proposal's responsiveness is based on the contents of the proposal itself without recourse to extrinsic evidence.

22. Evaluation and comparison

Total Score (100%) = Technical Evaluation (70%) + Financial Evaluation (30%)

Maximum Total Score = 1000

The Financial Proposal carries a total score of 300 points. The points for the financial proposal will be allocated as per the following formula:

$$\frac{\text{Lowest Bid Offered}^*}{\text{Bid of the Firm/Offeror}} \times 300$$

* "Lowest Bid Offered" refers to the lowest aggregate price offered by proposers scoring at least 70% points in Technical Evaluation.

The Contract will be awarded to the (agency/Organization/Firm) Offeror scoring the highest combined scores (Technical and Financial).

Technical evaluation criteria will be as follows:

Summary of technical proposal evaluation form	Score weight	Point obtainable
Expertise of the firm submitting proposal	10%	100
Methodology, its appropriateness to the ToR, condition and timeliness of the implementation plan	40%	400
Qualification and experience of personnel	50%	500
Total		1000

NOTE: Seventy percent weightage will be given to technical proposal and thirty percent for financial proposal.

Form 1: Criteria for evaluation of expertise of the firm

SN	Criteria	Obtainable points	Company/Firm				
			A	B	C	D	E
1	Minimum of 2 Years of Experience in Renewable Energy Projects	30					
2	Organizational structure (size of the firm, strength of project management)	35					
3	Completed task relevant to this activity	35					
	Sub-total	100					

Form 2: Criteria for evaluation of approach, methodology and appropriateness

SN	Criteria	Obtainable points	Company/Firm				
			A	B	C	D	E
1	Understanding of Existing GON act/guidelines/rules/directives of Water Supply and Irrigation System in Nepal	80					
2	Understanding of Context on Solar PV integrated water supply in Nepal	90					
3	Proposed approach and methodology	80					
4	Study Outline and Presentation	80					
5	Timeline plan	70					
	Sub-total	400					

Form 3. Criteria for evaluation of proposed human resources

SN	Criteria	Obtainable points	Company/Firm				
			A	B	C	D	E
Civil Engineering Expert	Minimum of Bachelor Degree in Civil Engineering	50					
	Minimum of 5 Years experience in drinking water project	200					
	Minimum of 5 Years experience in irrigation project	150					
	Experience in micro irrigation system (drip, sprinkler irrigation)	100					
	Sub-total	500					

F. Award of contract

23. Award criteria, award of contract

The RERL reserves the right to accept the proposal or reject all proposals at any time prior to award of the contract, without thereby any liability to the affected Offeror or any obligation to inform the affected Offeror or Offerors of the grounds for the Purchaser's action prior to the expiration of the period of proposal validity, the RERL will award the contract to the qualified Offeror whose proposal after being evaluated is considered to be the most responsive to the needs of the organization and activity concerned.

24. Purchaser's right to vary requirements

The purchaser reserves the right at the time of award of the contract to vary the quantity of services and goods specified in the RFP without any change in price or other terms and conditions.

25. Signing of the conditions

After the evaluation of the proposals, **a selected Offeror will be asked to enter into contract.** Within 5 days of the receipt of the contract, the successful Offeror shall sign and date the contract and return it to the purchaser.

General Terms and Conditions of the Contract

1. Independent Relationship

Nothing contained in the contract shall be construed as establishing or creating between Government and the Organization the relationship of a master and a servant or principal and agent, it being understood that the Organization is an independent person vis-à-vis Government.

2. Organization /Expert/Consultant's General Responsibilities

- The organization shall carry out services under this contract with due diligence and efficiency and in conformity with the highest standards of professionals and ethical competence and integrity.
- The Organization shall act at all times so as to protect, and not be in conflict with the interests of Government.
- The organization shall be responsible for the professional and technical services provided by him/her in the implementation of this contract.

3. Workmen's compensation and other insurance

The organization shall make his/her own arrangements regarding insurance for the medical expenses and for an accident, death and permanent disability for the period of this contract. All costs involved will be borne by the Organization.

4. Source of Instruction

The organization shall neither seek nor accept instructions from any authority other than AEPC/RERL's authorized agent in connection with the performance of services under this contract.

5. Prohibition on conflicting activities

The Organization shall ensure that he/she will not directly/indirectly engage in any activity that would conflict with those of RERL in respect of this evaluation.

6. Officials no to benefit

The Organization warrants that no RERL has been or will be admitted by him/her to any direct/indirect benefit arising from this contract or award thereof.

7. Assignment

The Organization shall not assign, transfer, pledge or make other disposition of this contract or any other parts thereof rights, claims or obligations under this contract, without prior written approval of RERL.

8. Records, Accounts, Information and Audit

- The organization shall maintain accurate and systematic records and accounts in respect of the services to be performed under this contract.
- The Organization shall furnish, compile or make available at all times to RERL any records or information, oral or written, which RERL may reasonably request for in respect of the services to be performed under this contract.

- The Organization shall allow RERL or its authorized agents to inspect and audit all such records or information upon reasonable notice.

9. Language

Unless otherwise specified in this contract, English language shall be used by the Organization in all written communications to RERL with respect to the services rendered and with respect to all documents procured or prepared pertaining to such services.

10. Equipment of property

Equipment or property furnished to the organization with funds supplied or reimbursed by the RERL or its agent shall be the property of the RERL and such equipment shall be returned to the duly authorized official of RERL upon completion of the services, conclusion of this contract or upon completion of the services, conclusion of this contract or upon termination thereof or when no longer required by the Organization. Such equipment or property when returned to RERL shall be in the same conditions as when delivered to the Organization, subject to the normal wear and tear. The organization shall in any event, be liable to RERL for the loss of or damage to such equipment or property through his/her fault or negligence.

11. Confidential Nature of Documents

All maps, drawings, photographs, mosaics and plans.

12. Amendments

The terms and conditions of this contract may be amended only in writing signed by both parties to this contract or their duly authorized representatives.

13. Obligation to Inform RERL of change in condition

The organization shall promptly and fully notify RERL in writing of any conditions, which interferes, or threatens to interfere, with successful carrying out of the services under this contract. Such notice shall not however relieve the Organization of his/her obligations to continue to provide services under this contract. Upon receipt of such notice, RERL shall take such action as in its sole discretion it considers to be appropriate or necessary under the circumstances.

14. Taxation

The Organization shall be liable for any tax levied on the remuneration and allowances paid as per this contract. Income tax on the remuneration and allowances paid to the organization will be deducted at source.

Proposal Submission Form (Company Letter Head)

The National Programme Manager
Renewable Energy for Rural Livelihood (RERL)
Khumaltar Height, Lalitpur, Nepal
Phone: 01 5539390, 5539391, Fax: 01 5542397
Website: <http://www.aepc.gov.np/rerl/>
Email: info.rerl@aepc.gov.np

Dear Sir,

Having examined the Solicitation Documents, the receipt of which is hereby duly acknowledged, we, the undersigned, offer to provide services to conduct evaluation of the Preparation of "**Technical Feasibility Study and Detailed Engineering Design of Solar Irrigation and Solar Drinking Water Projects and Site Supervision and Monitoring during construction for Belhi Integrated Rural Development Project (BIRD-DWIP)**" for the sum as may be ascertained in accordance with the Price Schedule attached herewith and made part of this proposal.

We undertake, if our proposal is accepted, commence and complete delivery of all services specified in the contract within the time frame stipulated.

We agree to abide by this Proposal for a period of 120 days from the date fixed for opening of Proposals in the invitation for proposal, and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

We understand that you are not bound to accept any proposal –whole or part –you may receive.

Dated this day/Month of year

Signature

Name

Position

Stamp

Duly authorized to sign Proposal for and on behalf of

Financial Proposal Submission Form

PRICE SCHEDULE

The Consulting Firm/Contractor is asked to prepare the Price Schedule alongwith the cost breakdown (as provided in this annex IV below) in separate envelope. All prices/rates quoted must be inclusive of all taxes. The Price Schedule must provide a detailed cost breakdown. Provide separate figure for each functional grouping or category. The format shown on the following pages should be used in preparing the Price Schedule. The format includes specific expenditures, which may or may not be required or applicable but are indicated to serve as the examples. Therefore, it should be considered as broad guidelines for Price Schedule (s).

Cost Breakdown by Cost Component [*This is only an Example*]:

S.N.	Particulars	Quantity	Unit	Rate NRs	Amount NRs.
A	Human Resource				
1	Civil Engineering Expert		MD		
2	Analysis and Report writing cost		LS		
3	Other administrative cost (if any)		LS		
4	Company Management Fee		LS		
B	Travel cost and DSA (if any)				
C	Total (A +B)				
D	VAT (13%) of C				
	Total (C+D)				

Notes:

1. Financial proposals will be selected on the basis of compliance with RERL costing parameters.
2. Payment will be made only for the activities costed in the financial proposal.

(Signature)

[Name and Signature of the Service Provider's Authorized Person]

[Designation]

[Date]

(Office Stamp)

Terms of Reference for

"Technical Feasibility Study and Detailed Engineering Design of Solar Irrigation and Solar Drinking Water Projects and Site Supervision and Monitoring during construction for Belhi Integrated Rural Development Project (BIRD-DWIP)"

1. Introduction

Alternative Energy Promotion Centre (AEPC) is a Government institution established on November 3, 1996 under the then Ministry of Science and Technology with the objective of developing and promoting renewable/alternative energy technologies in Nepal. AEPC has been successfully implementing/executing several renewable energy programmes in Nepal. Since July 16, 2012, AEPC has been executing its five year National Rural and Renewable Energy Programme (NRREP) as a single programme modality which aims to integrate alternative energy into the socioeconomic activities of rural communities.

United Nations Development Programme (UNDP) is one of the key development partners of AEPC and has been involved in the sector since 1996. In July 2014, UNDP in partnership with Global Environment Facilities (GEF) and AEPC initiated Renewable Energy for Rural Livelihood (RERL) project within the framework of NRREP to support it to meet some of its targets. The main objective of RERL is to assist in removal of barriers to increased utilization of renewable energy resources in rural Nepal and to reduce Green House Gas (GHG) emissions. RERL is assisting NRREP/AEPC on promotion of less disseminated technologies such as Mini Hydro, Large Scale Solar PV, larger Micro Hydro (more than 60kW) and mini/local grid.

2. The Context

Agriculture is by far the most widespread occupation in Dhanusha engaging more than half the labour force. Over two thirds of Dhanusha's total area is cultivable land. Around 69,000 hectares out of 76,000 are cultivated. Rice (62,000 ha), wheat (38,500 ha), pulses, maize (2,500 ha), oilseeds (3,000 ha), potatoes (2,250 ha) and sugarcane (3,500 ha) are the main crops grown in the district. Land productivity, however, is low, and most crops sustain the subsistence farmers themselves. Only 34,000 hectares (44%) are irrigated while the rest of the area depends on monsoon rainfall for agricultural production.

According to the District Water Induced Disaster Office 2,500 hectares of fertile, cultivable land is degraded due to soil erosion and annual floods in the district, mainly in the southern flood plan of Kamala and near other major rivers.

Fisheries are another agricultural facet of Dhanusha. The district has approx. 2,000 hectares of water ponds with a total fish production of 3,000 tons. Livestock farming is another sector with high development potential in the district, as almost every household keeps oxen for ploughing or animals for milk and meat production. Annual production of goat meat totalled 29,000 tons, chicken 456,000

tons, and a total number of 89.000 cows and 64.500 buffalos produced approx. 540.500 litres of milk equal to an average yield as low as 3.5 litres per animal, which makes room for considerable improvement.

Agriculture in the three villages can be characterized as poor in terms of productivity. Feed of high nutritive value for animals is not cultivated and dung is used for fuel rather than for natural fertilizer. Monsoon rainfall has become less stable and predictable possibly as a consequence of climate change. In 2016 Dhanusha only received 25% of the average quantity to the detriment of paddy output. A local pump station providing the irrigation canals with water was donated by Japan a few years ago where the boundaries of the three villages meet. Unfortunately, the person in charge of the coffer for maintenance suddenly disappeared with all the money leaving broken irrigation canals behind. The ensuing sharp decline of the rice harvest followed immediately after the earthquake.

On the other hand, the Belhi community is hit by severe scarcity of the drinking water after 2015 earthquake. The major reason drinking water problem are; lowering of water table, the under-ground water routes are diverted, excessive pumping in nearby vicinity of Belhi etc. There are manually operated several swallow tube wells. In more than 60% time of the year, the swallow tube well gets dried.

Hence, AEPC/RERL has decided to conduct and promote sustainable use of water resource by using renewable energy based water pumping system. This study aims to provide detailed engineering design of Solar Irrigation Pumping System as well as Solar Drinking Water Pumping System. Further, the consultant shall provide the technical support during implementation of the project.

3. Objective

The key objectives of this task is to provide technical support to conduct detailed engineering design, monitor the BIRD-DWIP project.

- i. Conduct detailed engineering design for civil components of solar irrigation project
- ii. Conduct detailed engineering design for civil components of solar drinking water project
- iii. Provide the technical support during installation, testing and commissioning of the project.

4. Scope of Work

The consultant should conduct, but not limited to, the following activities

1. Conduct detailed engineering design for civil works for solar irrigation project
 - a. Review the previous study conducted by RERL. Elaborate the shortcoming of the study and discuss with AEPC/RERL concern official to refine it.
 - b. Visit the site and obtain the local information to refine the study.
 - c. Based on the site condition, availability of existing infrastructures (like pond, planned cow shed etc), suggest suitable mounting structure of the solar system. RERL will provide information on weight of solar to be borne by the structures, wind information provided by community/department of meteorology.

- d. Design main overhead tank, distribution tanks, piping, pump house etc suitable for drip irrigation, sprinkler irrigation etc.
 - e. Consultant has to provide the design for poly house/ green house structure for modern agro farming, the dimensions will be provided by RERL.
 - f. The consultant has to provide all the structural design drawings.
 - g. Provide the BOQ of the system and support in the procurement.
 - h. Provide the on-site supervision of the installation of the Solar Irrigation Project.
 - i. Report to AEPC/RERL for the any deviation made by installer.
 - j. Consultant has to provide other civil engineering related support to solar irrigation and modern agriculture farming of Belhi if required.
2. Conduct detailed engineering design for solar drinking water project
- a. Carry out the site survey and need assessment for the drinking water or 270 households of Belhi in Hanspur Municipality Dhanusha.
 - b. Test water quality and recommend filtration system if necessary.
 - c. Prepare the layout of drinking water project.
 - d. Design the complete system including civil component, electro-mechanical components etc, RERL will provide design parameters for selection of solar components based on head and discharge.
 - e. Conduct structural analysis of the major civil components.
 - f. Prepare the drawings of all components.
 - g. Provide the technical specification of major component of the system for the purpose of preparation of tender document of the project.
 - h. Provide the BOQ of the system and support in the procurement.
3. Provide the technical support during installation, testing and commissioning of the project.

Since, the financial closure of this project is confirmed, it is likely that the procurement shall be initiated immediately after providing final report of above two tasks. Thus same consultant shall be engaged on site supervision and monitoring during the installation.

- a. Consultant shall be engaged on factory inspection of the major equipment if deemed necessary.
- b. Prepare the receipt of equipment delivered at site. Inspect for any damage and deviation from the specification in the contract with the vendor.
- c. Provide technical support during the installation of civil infrastructure for both drinking water and irrigation project.
- d. Prepare the completion report and share with concerned official of AEPC/RERL.

5. Duration of the Task

The two task is expected to be completed in three month from the time of signing the contract however the consultant shall be engaged until the project shall be completed mainly for supervision and monitoring of the project. The expected date of completion of the project is December 2019.