

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

REQUEST FOR PROPOSAL FOR CONSULTING SERVICES

RFP No.:RERL/017/2018

Title of Consulting Services

**PREPARATION OF
DETAIL FEASIBILITY STUDY (DFS) OF SOLAR PV PUMPING FOR IRRIGATION IN "BUNIYAD TOLE
PARWANIPUR GAUPALIKA BARA" and "JALESHWOR MUNICIPLITY WARD NO. 5 & 12"**

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: 12 September 2018

Deadline for Submission of RFP: 26 September 2018

Date.....

Dear Sir/Madam

Subject: Preparation of Detail Feasibility Study (DFS) Of Solar Pv Pumping For Irrigation In "Buniyad Tole Parwanipur Gaupalika Bara" and "Jaleswor Municipality Ward No. 5 And 12"

Detail Feasibility Study (DFS) of Solar PV Pumping For Irrigation in "Buniyad Tole Parwanipur Gaupalika Bara" and "Jaleswor Municipality Ward No. 5 and 12"

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 26 September 2018

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: 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 **Detail Feasibility Study (DFS) of Solar PV Pumping For Irrigation in "Buniyad Tole Parwanipur Gaupalika Bara" and "Jaleswor Municipality Ward no. 5 and 12"**.

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: 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 2073/74
- 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 Detail Feasibility Study (DFS) of Solar Pv Pumping For Irrigation in Buniyad Tole Parwanipur Gaupalika Bara and Jaleswor Municipality

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 2 years of experience in renewable energy projects. Preference will be provided to the consulting firms with prior experience in preparing feasibility studies regarding integrated water supply Systems. 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. 2073/74 Tax Clearance Certificate

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.

Agriculture and irrigation conveyance and drinking water system expertise (Team Leader):

- Minimum of three (3) years' experience in agriculture projects in Nepal or overseas and must have a minimum of bachelor's degree in Agriculture Science/Engineering;
- Have in-depth knowledge on the synergy of water availability, irrigation and agriculture; and must have experience in sustainable agricultural practices, assessment of demand against viability of selected crop in the specified site, use of fertilizers, water requirement analysis for different crops including the vegetables and fodder and forage

Renewable Energy expertise:

- Minimum of two (2) years' experience in designing and implementing solar PV pumping system projects and must have a minimum of bachelor's degree in Engineering, with a preference in Electrical or Mechanical engineering.

- Knowledge of integration of energy and solar-PV technology into a multiple water use system by closely coordinating the activities between agriculture, irrigation and environmental components.

Socio-economic/Social Safeguard expertise:

- Minimum of Bachelor Degree in Social Science/Anthropology/Economics
- In-depth knowledge and practical experience in rural community engagement setting including GESI assessment, social and economic impacts of irrigation systems.
- Experience in the field of management, which a social science background considered a strong asset.

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 of 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.

<u>Amount in percentage</u>	<u>Payment</u>
i) 30%	Immediately after Signing Contract.
ii) 50%	After submission of draft final report
ii) 20%	After submission of final report, approval from concern authority of AEPC/RERL

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

b. Deliveralbe (output)

The followings will be suggested outputs of the assignment:

Draft Inception report- soft copy within 15 days of contract signing

Draft report - soft copy within 2½ month of contract signing

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

D. Submission of Proposals

16. Sealing and marking of Proposals

The Offeror shall seal (lahachhap) 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: rerl@aepc.gov.np

And,

Marked with:

Preparation of Detail Feasibility Study (DFS) of Solar Pv Pumping for Irrigation in "Buniyad Tole Parwanipur Gaupalika Bara" and "Jaleswor Municipality Ward No. 5 and 12"

(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, 26 September 2018**.

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 Irrigation System in Nepal	80					
2	Understanding of Context on Solar PV Pumping for Irrigation	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
Team leader	Minimum of Bachelor Degree in Agriculture Science/Engineering	50					
	Minimum of 3 Years experience in designing Irrigation project and Agro Forestry	80					
	Minimum of 1 Years of specific experience designing Solar PV Pumping based Irrigation Projects	70					

RE Expert	Minimum of Bachelor Degree in Electrical/Electronics/Mechanical Engineering	50					
	Minimum of 2 Years of Experience in Designing Solar PV Pumping System	60					
	Experience in designing Integrated Solar PV systems considering water table for Terai	70					
Social Safeguard Expert	Minimum of Bachelor Degree in Social Science/Anthropology/Economics	40					
	Minimum of 1 Years of Experience in Preparing GESI assessment for Renewable Energy Projects	50					
Team composition	Coherence in team composition	30					
	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: 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 **Detail Feasibility Study (DFS) of Solar PV Pumping For Irrigation in "Buniyad Tole Parwanipur Gaupalika Bara" and "Jaleswor Municipality Ward no. 5 and 12"** 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	Team leader		MD		
2	RE Expert		MD		
3	Social Safeguard Expert		MD		
4	Analysis and Report writing cost		LS		
5	Other administrative cost (if any)		LS		
6	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
Preparation of Detail Feasibility Study (DFS) of Solar PV Pumping for Irrigation in
"Buniyad Tole Parwanipur Gaupalika Bara" and "Jaleshwor Municipality Ward No. 5
and 12"**

1. Background

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, currently under Ministry of Energy, Water Resource and Irrigation 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. Context

Parwanipur Rural Municipality and Jaleshwor Municipality is planning to establish a demonstration of Agroforestry promoting plantation of varieties of multipurpose forest species along with agriculture crops beneath the tree species. They have envisaged increased productivity of their land and simultaneously decrease pressure on nearby forest turning towards a Green Rural Municipality. Currently irrigation is heavily dependent on diesel pump making the operation cost high and polluting the environment. In this context, Parwanipur and Jaleshwor municipality requested RERL to support on carrying out a DFS study.

In response, AEPC/RERL decided to conduct and promote sustainable use of water resource by using renewable energy based water pumping system. As published in the white paper, the Ministry of Energy, Water Resource and Irrigation has focused on pumping through clean energy with a statement "नदी किनाराका गरा, सदा हराभरा" highlighting need and opportunity for solar PV pumping in Terai. In this regard, AEPC/RERL will conduct DFS of solar-PV based irrigation system in Buniyad Tole of Parwanipur Municipality and Ward No. 5 and 12 of Jaleshwor Municipality. The local contacts for this activity are Mr. Mishri Mahto, Ward Chair of Ward no. 1 of Parwanipur RM and Mr. Rama Shankar Mishra, Mayor Jaleshwor Municipality for Ward No 5 and 12.

3. Objectives of the Assignment

The objective of this assignment is to carry out a Detail Feasibility Study Of Solar PV Pumping for Irrigation in Buniyad Tole Parwanipur Gaupalika Bara and Jaleswor Municipality Ward no. 5 and 12.

4. Scope of Work

The consulting firm is expected to deliver minimum of below mentioned scope of works:

1. Conduct initial relevant policy and local stakeholder analysis at the target site.
2. Conduct initial resource assessment for development of potential, crops, vegetables and fodder and forage for agroforestry farming.
 - a. This assessment must include: Soil properties, soil-water relationships, type of crop and sensitivity to drought stress, stage of crop development, availability of water supply, climate factors (rainfall, temperature) using standard tool and methodology
 - b. Review of current and traditional approach to crop cultivation, assessment of historical patterns of cultivation, taking into account cultural significance in cultivation of particular crops and focus on organic and sustainable practices with relevant examples and practices as an evidence.
 - c. Review land resource availability and land ownership for irrigation fields and solar-PV pumping components.
3. Based on resource assessment, discussion with rural municipality, provide suggested crop cultivation pattern which enhances the community's socio-economic livelihood and meets the environmental and social conditions of the land.
4. Conduct a water resource availability assessment to ensure current and proposed crop patterns do not degrade water availability and in future potential cultivation patterns and develop an appropriate crop calendar.
 - a. The water assessment should take into account current water demand needs for irrigation, and potential future increase based on shifting cultivation and increased livelihood of the community.
 - b. Ensure irrigation water requirements do not lead to negative environmental and social impacts at the sources and downstream.
5. Carry out the optimization analysis (both technically and economically) between Solar PV and grid supply (if available) options for electricity supply to water pump.
6. Based on resource, water availability and environmental assessment, identify the potential irrigation conveyance and drinking water supply systems from source to point of use (flood, sprinkler, drip and trickle) and conduct irrigation planning application. This should be based

on Department of Irrigation (DoI) format. The consultant has to consult with DoI official for specific format of DoI for designing and costing irrigation system.

7. Develop sizing and design and bill of quantities (BOQ) of solar PV system. Design should include all the technical specifications of irrigation conveyance systems including layout and drawing of major component of irrigation conveyance as a whole etc.
8. Conduct economic and financial analysis through cost benefit analysis using standard methods and tools of solar PV pumping against diesel generators, tariff structure, and installation and operation costs associated with solar PV pumping system, income generation by solar PV pumping from tariff collection. Evidence collected during the study should only be used for justifying this assessment.