



**MINISTRY OF DEFENCE THROUGH THE PROJECT DIRECTOR OF ITS GREENAI  
PROJECT MANAGEMENT UNIT (“PROCURING AGENCY”)**

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**REQUEST FOR PROPOSAL  
GREENAI-AAUR-SMARTFARM/RFP01/2025**

**FOR**

**DESIGN & DEVELOPMENT OF 10 ACRES GREENAI SMART FARM ON  
TURNKEY BASIS**

**AS A COMPONENT OF PSDP APPROVED PROJECT TITLED  
“DEVELOPMENT OF ICT AND ARTIFICIAL INTELLIGENCE (AI) BASED  
PRECISION AGRICULTURE SYSTEMS UTILIZING DUAL-USE  
AEROSPACE TECHNOLOGIES - GREEN-AI”**

Issue Date: 17 February, 2025

1. The procuring agency invites sealed bids from Firms, companies registered with Income Tax and Sales Tax Department for “Design & Development of of 10 Acres GreenAI Smart Farm on Turnkey Basis” as specified in Request for Proposal document. Bidders may form Joint Ventures or Consortiums, with a lead company submitting the proposal, ensuring clear role definitions, accountability, and a legally binding agreement outlining responsibilities, financial commitments, and execution methodology.
2. A complete set of bidding documents, containing detailed terms and conditions are available for the interested bidders at Project Management Unit (PMU), Project GreenAI NASTP, Alpha 03, Old Airport Road, Rawalpindi (if required). Price of bidding documents is Rs. 1000/-. To discuss the RFP, a **Pre-bid meeting** would be held at the above-stated address at **1130 hrs on 26 February, 2025**. All Prequalified firms are requested to attend the pre-bid meeting. No TA/DA would be admissible.
3. Bids prepared in accordance with instructions in the bidding document must reach at following address on or before **10 March, 2025** at **1330hrs**. Bids will be opened on same day **10 March, 2025** at **1400hrs** in presence of bidders or their authorized representatives.

**Project Director (GreenAI)**  
NASTP, Alpha 03,  
Old Airport Road, Rawalpindi

Date:- February, 2025

Email: [pd@greenai.org.pk](mailto:pd@greenai.org.pk)

**DISCLAIMER**

All information provided / clarified in this Request for Proposal (RFP) is in the best interest and faith of the parties involved. This RFP is neither an agreement nor an offer/ invitation of agreement by the procuring agency to the prospective bidders or any other person. The purpose of this RFP is to provide interested parties with information that may be useful to them in the formulation of their proposals pursuant to this RFP. The information published in this document is not intended to be exhaustive. Though adequate care has been taken in the presentation of this RFP document, the assumptions, assessments, statements, and information contained in this RFP, may not be complete, accurate, adequate, or correct. Interested bidders shall, therefore, required to make their own investigations and assumptions wherever required and satisfy themselves that the RFP document is complete in all respects. Intimation of discrepancy, if any, should be given to the specified office immediately. If no intimation is received by the office till the date mentioned in the document, it shall be deemed that the RFP document is complete in all respects and parties submitting their proposals are satisfied that the RFP document is complete in all respects.

Information provided in this document or imparted to any respondent as part of RFP process is confidential to the procuring agency and shall not be used by the bidders for any other purpose, distributed to, or shared with any other person or organization.

<b>HBL ISLAMIC BANKING</b>		<b>Deposit Slip</b>	
		<b>Customer Copy</b>	
Branch: _____		Date: 14/02/2025	
Account Title: Public Procurement Regulatory Authority, Islamabad.			
IBAN: PK H A B B 0 0 0 6 4 5 4 0 0 1 3 1 0 1 7 0 1			
Currency: <input checked="" type="checkbox"/> PKR <input type="checkbox"/> USD <input type="checkbox"/> EURO <input type="checkbox"/> GBP <input type="checkbox"/> JPY <input type="checkbox"/> Others		Account Type: <input type="checkbox"/> Current <input type="checkbox"/> Savings	
Credit Card No. _____			
<input type="checkbox"/> CASH		AMOUNT	
BANK / BRANCH: HBL		CHEQUE/INSTRUMENT NO.: B619360	45000/-
		TOTAL AMOUNT	45000/-
Total Amount in Words: Forty five thousand only.			
Depositor's Name: M. Adnan		Other Banks Cheque Deposit	
Contact No.: 0321-5757370		Branch: 5384-IBB Ghouri Town Br	
Depositor's CNIC No.: 42014524320-7		From Account: XXXXXXXX	
(For non-HBL/Walk-in Customers, Also attach CNIC Copy)		Account Name: PK17HABB0004540013100701	
Depositor's Account No. _____		Amount: *****45,000.00 PKR	
(For HBL Customers/ Account Holders)		Charges: *****00 Date: 2025-02-14	
Received By: _____		Teller: CL35 Time: 15.04.52.701000	
Depositor's Signature: _____		(As per Terms & Conditions on reverse) (Not official unless validated)	
27002043			

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## **BIDDING PROCESS INSTRUCTIONS**

1. **Bid Reference No.** GREENAI-AAUR-SMARTFARM/RFP01/2025
2. **Procurement Agency**  
Ministry of Defence through the Project Director of its GreenAI Project Management Unit.
3. **Invitation of Bid**  
Procuring Agency invites sealed bids for "Design & Development of 10 Acres GreenAI Smart Farm on Turnkey Basis" during financial year 2025-26 as per RFP.
4. **Pre-bid Meeting**  
To clarify any ambiguity / lack of understanding before submission of final bids, aZara meeting is planned for convenience of bidders on 1130 hrs on 26 February, 2025 at **NASTP Alpha-03, Old Airport Road, Rawalpindi**. Participating firms are requested to provide particulars of their reps on Ph. No. 0324-4411999 at least one (01) day prior to Pre-bid meeting or tender opening date for necessary arrangements. The bidders' representatives should attend, at their own cost, expense and arrangement (including obtaining visas and travel documents, if required), the meeting(s) to obtain clarifications and any other information required for preparation of the Bid. Moreover, the procuring agency may organize more than one (01) pre-bid meeting.
5. **Last Date & Time of Submission of Bid:** 10 March, 2025 at 1330hrs
6. **Bid Opening Date & Time:** 10 March, 2025 at 1400hrs
7. **Bid Opening Address**  
Project Management Unit (PMU), Project GreenAI, NASTP, Alpha 03, Old Airport Road, Rawalpindi.  
Tel: 0321-9400527, 03244411999  
Email: sm\_scm@greenai.org.pk
8. **General Instructions to Bidders**
  - (a) The bidder shall bear all its costs associated with or relating to the preparation and submission of its Proposal including but not limited to preparation, copying, postage, delivery fees, expenses associated with any demonstrations or presentations which may be required by the procuring agency, or any other costs incurred in connection with or relating to its Proposal.
  - (b) The procuring agency reserves the right to reject any or all of the bids submitted in response to this RFP document at any stage without assigning any reasons whatsoever. The procuring agency also reserves the right to withhold or withdraw the process at any stage with intimation to all who have submitted their proposals in response to this RFP.
  - (c) Any time prior to the deadline for submission of bids, the procuring agency may change / modify / amend any or all of the provisions of this RFP document without assigning any reason. All addenda / corrigenda shall form part of the RFP documents and shall be notified in writing to all prospective bidders and will be

binding on them. The prospective bidders should acknowledge receipt of any such addendum / amendment in the RFP document(s).

(d) The Bidder may modify or withdraw its Bid after the Bid submission but prior to deadline for submission of the Bids, provided that written notice of the modification or withdrawal is received by procuring agency.

(e) No Bid may be modified subsequent to the deadline for submission of the Bids.

(f) No Bid may be withdrawn in the interval between the deadline for submission of Bids and the expiry of the period of Bid validity specified by the Bidder on the Bid Form. Withdrawal of a Bid during this interval may result in forfeiture/encashment of the Bid Security.

## 9. Procurement Procedure

The procuring agency is adopting a '**SINGLE STAGE-TWO ENVELOPE**' bid procedure as specified in rule 36(b) of PPR 2004.

## 10. Language of Bid

The Bid prepared by the bidder and all correspondence and documents relating to the Bid exchanged between the Bidder and procuring agency and / or any representative of procuring agency, shall be written in English language. Any supporting printed literature furnished by the Bidder written in another language should be accompanied by an English translation of its pertinent pages in which case, for purposes of interpretation of the Bid, the English translation shall govern.

## 11. Submission of Proposals

(a) Proposals are to be submitted as hard copy via post or by-hand sealed as under:

(i) The Bid shall comprise a single package containing two (02) separate envelopes. Each envelope shall contain separately the technical proposal and the financial proposal.

(ii) **Technical Proposal:** Technical proposal is to be submitted in **duplicate** in a separate sealed envelope and clearly marked "**Technical Proposal without prices**", Tender number and date of opening. The Technical Proposal Envelope shall contain: -

A. Technical Proposal as per System Requirement Specifications **Annexure 'A'**

B. Bidding Forms & **Annexure 'D' to Annexure 'F'** (Duly filled & signed by authorized signatory)

C. Bid Security in a separate sealed envelope clearly marked **Bid Security**, Tender Number.

D. Soft copy of Technical Proposal in the form of USB in a separate sealed envelope clearly marked "**Soft Copy of Technical Proposal**", Tender Number.

(iii) **Financial Proposal:** It shall contain Financial Proposal Form **Annexure ‘C’** filled and dully signed in a separate sealed envelope clearly marked on the face **“Financial Proposal with prices”**, tender number.

(iv) Both the **“Envelopes”** of Technical and Financial proposals should be enclosed in one cover, properly sealed, and bear the address of procuring agency with tender number and opening date.

(b) Failure to provide any of the required information specified in the RFP document with the ‘Technical Proposal’ (Envelope 1), and in the prescribed format (where applicable), may lead to disqualification of the Bid and the affected Bidder’s ‘Financial Proposal’ (Envelope 2) will be returned unopened.

(c) The procuring agency reserves the right to verify the letters, documents or information provided by any bidder from issuing parties and may (together with its advisers) visit and hold meetings with them which shall be facilitated by the bidder. Furthermore, failure to provide the Financial Proposal in the form required under this RFP document may also result in disqualification of the Bid.

## 12. Joint Venture and Consortium Participation

(a) To ensure a comprehensive and high-quality solution, bidders are permitted to form Joint Ventures (JVs) or Consortiums for this project. Interested companies may collaborate by entering into a formal agreement to jointly submit a proposal that meets the full scope of requirements.

- (i) The joint proposal must be submitted under a lead (mother) company, which will serve as the primary contracting entity and assume full responsibility for project execution, compliance, and deliverables.
- (ii) Each participating entity must explicitly define its role, scope of work, and key deliverables in the proposal, ensuring clear accountability and avoiding overlaps or ambiguities.
- (iii) A legally binding Joint Venture Agreement (JVA) or Consortium Agreement must be signed by all involved parties and submitted as part of the proposal. The agreement should outline governance structure, financial commitments, liability distribution, and dispute resolution mechanisms.
- (iv) The lead company will be the single point of contact for all contractual, financial, and administrative matters, ensuring seamless project management.
- (v) The financial and technical capabilities of all partners will be jointly evaluated, and the proposal must demonstrate the combined strength and synergy of the JV or Consortium to effectively execute the project.
- (vi) Any subcontracting arrangements within the JV must also be transparently declared, with clear details of responsibilities and execution methodology.
- (vii) In case a JV proposal is submitted, failure to provide a well-defined partnership structure and accountability details may result in disqualification. The procuring agency reserves the right to conduct its audit / verification / evaluation of the JV agreement / documentation submitted in this regard.

### 13. Evaluation Process

- (a) The procuring agency intends to exercise the MOST ADVANTAGEOUS bid in conformance with PPR 2004.
- (b) The Bid shall comprise a single package containing two (02) separate envelopes. Each envelope shall contain separately the technical proposal and the financial proposal.
- (c) The envelopes shall be marked clearly as “TECHNICAL PROPOSAL” and “FINANCIAL PROPOSAL” in bold and legible letters to avoid confusion.
- (d) Initially, only the envelope marked “TECHNICAL PROPOSAL” shall be opened.
- (e) The envelope marked as “FINANCIAL PROPOSAL” shall be retained in the custody of the procuring agency without being opened.
- (f) Procuring agency shall evaluate the technical proposal in the manner prescribed herein, without reference to the price and reject any proposal which does not conform to the specified requirements.
- (g) During the technical evaluation no amendments in the technical proposal shall be permitted.
- (h) Technical Qualification evaluation shall be based on the criteria given in **Annexure ‘B’ Evaluation Criteria**, regarding Bidder’s Technical Experience, Product Capabilities, System Specifications and Solution Presentation, etc. as demonstrated in the qualification documents submitted by the Bidder.
- (j) The Bidders qualifying in each of the category as per the SRS-01 Annexure ‘A’ evaluated through Annexure ‘B’ in addition to the fulfilment of mandatory requirements, shall be considered qualified.
- (k) Financial bids of only the technically qualified bidders shall be opened and evaluated by procurement committee as per PPRA rules.
- (l) Work will be awarded to the bidder offering most advantageous bid evaluated.
- (m) Prior to the expiration of the period of bid validity, procuring agency will notify the successful bidder in writing of its intent to award the contract. The contract will be executed subject to satisfactory discussion of the terms and conditions of the contract. The discussion shall be in accordance with PPR 2004 provisions of Pakistan. The form of contract is attached as **Annexure ‘G’**.
- (n) Upon the successful bidder’s furnishing of performance guarantee pursuant to this RFP, procuring agency will promptly notify each unsuccessful Bidder and will discharge their respective bid security(s). The technical and financial proposals of both successful and unsuccessful bidders will be retained by the procuring agency.
- (p) The bid sum as submitted and read out during financial bid opening shall be absolute and final and shall not be the subject of correction, adjustment or amendment in any way by any person or entity except that if the Bid is substantially responsive, the procuring agency shall handle only the undermentioned errors on the following basis:

- (i) Bidders shall be notified of any correctable error detected in their bid during the notification of award.
- (ii) Any arithmetic errors in the submitted bid arising from a miscalculation of unit price, quantity, subtotal and total bid price shall be rectified on the following basis:
  - A. If there is a discrepancy between words and figures, the lowest amount, either in words or figures, shall be considered.
  - B. If there is discrepancy between the unit price and the total price which is obtained by multiplying the unit price and quantity, or between sub-total and the total price, the unit or sub-total price shall prevail, and the total price shall be corrected.
  - C. In case of discrepancy between sub-total price obtained by adding various prices in the schedule and the sub-total price indicated for that particular schedule, the sub-total obtained by addition of various arithmetically corrected prices would be considered for evaluation.
  - D. In case of any discrepancy in the applicable rates or calculation of applicable taxes discussed, agreed and added to the contract amount in separate lines, as needed, corrections in item and subtotal prices may be allowed as per applicable Govt. rates / rules.
  - E. The procuring agency shall be entitled to award the contract to the most advantageous bidder after applying permissible arithmetic / tax corrections in the bid proposal sheets. If the bidder does not accept the correction of the errors as above, his bid will be rejected.

#### 14. **Consultancy**

A minimum of 03 consultants / part time HR is to be engaged by the bidder for the duration of contract validity. The proposed team members / part time HR / consultants would be engaged with mutual consent of both the parties with PD GreenAI as final authority. The details of the HR are to be mentioned in Form A-5.

#### 15. **Bid Security**

- (a) Bid security will be equal to **Rupees 250,000/-** and will be in the shape of pay order / demand draft in favor of Project Director GreenAI, Alpha-03, Old Airport Road, NASTP Rawalpindi. Bid security shall be attached with the technical proposal otherwise proposal will not be accepted.
- (b) Bids without required Bid security will be rejected without any right of appeal.
- (c) The bid security shall be forfeited in case of occurrence of any one of the following:
  - (i) If a bidder withdraws its bid during the period of bid validity specified in this RFP document; or
  - (ii) In the case of successful bidder, if it fails:
    - A. To furnish Performance Guarantee in accordance with the RFP document; and



B. To sign the contract.

(d) Bid security of unsuccessful bidders will be returned upon the award of contract to successful bidder, and after furnishing of the Performance Guarantee.

## 16. Performance Guarantee

(a) Performance Guarantee (PG) equal to **10%** of total contract amount will be submitted before signing of contract. PG will be kept against SLA/support and will only be released after completion of warranty / technical support period (1 year) as per the contract.

(b) The Performance Guarantee shall be as Bank Guarantee Form (attached with draft contract) or CDR from any Scheduled Bank in Pakistan in favor of Project Director GreenAI, Alpha-03, Old Airport Road, NASTP Rawalpindi.

(c) In case of cancellation of contract due to default of the supplier, the performance guarantee shall be forfeited in favor of procuring agency.

(d) The bidder should quote its rates clearly in Pak Rupees in the Financial Proposal in both figures and words as per format attached at **Annex 'C'**.

(e) The rates for each of the component / system / subsystem / item / service shall be quoted on separate lines.

(f) The Bid shall remain valid for **ninety (90) calendar days** from technical bid opening date and further it may be requested to be extended by procuring agency.

(g) A bid valid for a shorter period shall be rejected by procuring agency as non-responsive.

(h) Price and all other terms and conditions shall be fixed and firm throughout Bid validity period.

(i) No currency exchange rate will be applicable and bids with a condition of currency exchange rate applicability will be rejected without any right of appeal.

(j) Bid(s) shall be inclusive of all applicable taxes, duties, charges, levies, etc.

## 17. Payment Procedure

(a) Milestone based payment disbursement procedure will be adopted.

(b) Acceptance criteria against milestones will be finalized as per required specifications and made part of the contract document. All payments will be subject to acceptance of milestones against the acceptance criteria which is made part of the final contract.

(c) Bidder is to present a Sales Tax invoice (where applicable) / numbered bill upon completion of each milestone for disbursement of the amount agreed upon for the completed milestone as per the final contract.

(d) All taxes applicable on the amount of bill will be deducted at source.

(e) Crossed cheques of applicable amount (in the favor of the respective bidder) will be issued from Project Director (**GreenAI Project**).

(f) Milestones and deliverables are as mentioned in Table 1.

(g) Bank charges incidental to the withdrawal of payment shall be borne by the Supplier.

**Table 1. Schedule of Payment\***

<b>S. No</b>	<b>Conditions</b>	<b>Payment to be made</b>
1.	Signing of Contract <b>Mobilization Advance:</b> After Receipt of Bank Guarantee / CDR amounting equal to the mobilization advance amount agreed by the parties (up to 20%) from a Scheduled Bank of Pakistan in prescribed format	Up to 20%
2.	Delivery, Installation and Acceptance of all the systems / subsystems / components / parts and services as per the details mentioned in the RFP as well as those offered by the Bidder in its Technical and Financial Proposals <b>Over And Above The Requirements of RFP.</b>	40%
3.	Integration, testing and successful demonstration of the complete system to the Acceptance Team nominated by the PD GreenAI. Bank Guarantee against Mob Advance (if any) shall be returned with a total payment of 70% against the contract value.	10% (Total 70%)
4.	One month continuous and successful operations of complete smart farm. The operations of the smart farm are to be conducted by the Tech Team of the bidder with all administrative arrangements being responsibility of the bidder. The operations would be monitored and demonstrated to the Tech Team of the procuring agency.	20%
5.	Delivery and acceptance of: <ul style="list-style-type: none"> <li>• Final design documents, manuals and drawings as per component 7 of the SRS (Technical Requirements) (Min 05 hard copies)</li> <li>• Complete software package / programs / codes</li> <li>• Project completion report</li> <li>• Training of technical staff</li> <li>• Acceptance / completion certificate issued by the user</li> </ul>	10%

\* **Note:** Partial payments against each milestone may be processed by the successful bidder depending upon the requirements and after approval of the procuring agency. PD GreenAI would be the final authority for processing of any partial payments on case to case basis.

#### **18. Delivery/Completion Period**

(a) All components of the tender shall be delivered within Six (06) months' time after effective date of signing of Letter(s) of Acceptance (LoAs).

(b) Delivery period may be extended in case of events beyond the reasonable control of Bidder. Bidder shall inform in writing to procuring agency of any such event and may request for extension in delivery period.

#### **19. Litigation**

In case of any dispute only Court of Jurisdiction at Islamabad Pakistan will have the Jurisdiction to decide the matter.

#### **20. Force Majeure**

(a) "Force Majeure" means an exceptional event or circumstance, which is beyond a Party's control; which such Party could not reasonably have provided against before entering into the Contract; which, having arisen, such Party could not reasonably have avoided or overcome; and, which is not substantially attributable to the other Party.

(b) The developing agency / firm / vendor shall, within fifteen (15) days of its commencement, notify the Procuring Agency of any such event, act or circumstance which is relied upon by the Supplier for its inability to comply with its obligation. The Purchaser shall have the right to conduct investigations to satisfy itself about the genuineness of the "Force Majeure" event, act or circumstance. Non-availability of raw material for the manufacture of the Goods or export permit for the export of the Goods from the country of its origin shall not constitute "Force Majeure."

(c) If by reason of "Force Majeure" the Goods are not delivered by the due date, then the Delivery Period may be extended appropriately for the purpose, provided the said Goods shall be ready to be delivered within one (1) month of the stipulated delivery date. If the said Goods are not ready to be delivered after the lapse of one (1) month as aforementioned, then the Purchaser shall have the right to cancel the Contract by informing the Supplier of the cancellation in writing. This, however, will not apply to consignments of Goods already accepted and delivered according to the terms of the Contract. The Supplier shall not be entitled to any compensation whatsoever as a result of this cancellation.

#### **21. Arbitration**

All matters of dispute or difference, except regarding rejection of stores / Services by the inspector and or cancellation of the contract by the Purchaser arising out of this contract between the parties hereto, shall be settled by mutual agreement, failing which they shall refer for Arbitration to Project Director Green AI who will be the sole arbitrator of the disputed matter and two representatives, one to be nominated by each party, will assist PD Green AI for decision. The award/decision of PD Green AI (The Sole Arbitrator) will be final and binding on all parties such as Supplier, Purchaser and related party (if any).

#### **22. Risk Purchase**

In the event of failure on the part of the developing agency to comply with the contractual obligations, the contract is liable to be cancelled at his risk and expense of Successful bidder.

#### **23. Application of Official Secret Act 1923**

All matters connected with this in query and subsequent actions arising there after fall within the scope of the Pakistan Official Secret Act 1923 which forbids providing

contractual information to un- authorized/ un-concerned person/ organization. It is therefore, requested to ensure complete secrecy regarding documents and stores concerned with the inquiry to limit the number of employees having accesses to this information.

#### **24. Withdrawal of Offer**

If the bidder withdraws its bid or backs out from providing items won by the bidder within validity period at any stage of contract finalization, procuring agency may place such bidder under embargo for a period of twelve months, which may extend up to eighteen months and forfeiture of Bid Security or Performance Guarantee, as applicable.

#### **25. Disqualifications**

Proposals will be liable to be rejected if any deviation is found from the instructions as laid down in the bid document i.e.

- (a) Technical bid is submitted without the required bid security.
- (b) Proposals are found conditional or incomplete in any respect.
- (c) Multiple rates are quoted against one item.
- (d) Bids are received after specified date and time.
- (e) Mandatory requirements of Evaluation Criteria are not fulfilled.
- (f) Mandatory Technical Requirements of UAS are not properly adhered to.
- (g) Bidder is not the principal manufacturer of proposed & baseline platforms.
- (h) Any inferior product/specifications than the specifications provided in SRS-01 document.

#### **26. Authority to Sign Documents**

Proposal must be accompanied by Letter of Authorization to sign the Tender on behalf of the Bidder. Bidder must prove that the person who signs this Tender is fully authorized to bind his establishment / company.

#### **27. Grievances Redressal Committee (GRC)**

(a) After submission of bid and prior to award of the contract, any bidder feeling aggrieved by any act of procuring agency may lodge a written complaint concerning his grievances to GRC constituted under Rule 48 of PPRA within 07 days of announcement of the technical evaluation report and 05 days after issuance of final evaluation report.

(b) GRC will immediately initiate the investigative action and decide the complaint within ten days of its receipt. The decision of GRC shall be intimated to the complainant / aggrieved bidder. The decision of the GRC shall be binding upon all the parties.

#### **28. Bidding Clarifications**

(a) In case any clarification is required regarding RFP, bidder may contact on following address till one week prior to the deadline for submission of tenders.

Technical Clarification: 03335261488/ 03215562788

Bidding Procedure: 03219400527 / 03244411999

A prospective bidder requiring any clarification of the RFP documents which is

essential to enable the prospective bidder to submit its Bid, may notify the procuring agency in writing through on email address of the Project Director GreenAI mentioned below.

(b) The procuring agency may reach out to the prospective bidders for additional information or clarification during the submission, evaluation, and discussion periods.

## **29. Rights Reserved**

Procuring Agency reserves the right to accept or reject any proposal and to annul the procurement process and reject all proposals at any time prior to contract award as per rule 33 of PPR 2004 without there by incurring any liability to the affected Bidder.

Date:- February, 2025

**Project Director (GreenAI)**  
NASTP, Alpha 05,  
Nur Khan Base, Old Airport Road,  
Rawalpindi  
Email: pd@greenai.org.pk

## SYSTEM REQUIREMENTS SPECIFICATIONS (SRS-01) DEVELOPMENT OF 10 ACRES GREENAI SMART FARM

### Introduction

1. Precision agriculture is a multidisciplinary approach towards efficient farming that covers a broad array of topics, including characterizing variability in soil resources & tillage, irrigation, remote sensing, plant genetics and crop physical, biological and chemical inputs etc. In order to improve yield and to minimize the damage to crops and resource utilization, an intelligent monitoring framework with automated smart interventions is required which is the foundation of a Precision Agriculture Solution. **One of the key factor has remained efficient irrigation methodologies to reduce water loss and input precise amount of water as per requirement of the crop.**

2. Thus, government always encourages the farmers to reduce the water losses through proper water management practices. In addition to this, government introduced different precision agriculture-based technologies such as land levelling, solar powered drip irrigation systems on subsidized rate, etc. Recent studies have shown significant increase in drip irrigation systems in Punjab and upstream maintenance facilities are reducing significant barriers to drip-irrigation adoption. However, application of the right combination of water and nutrients directly to the roots of each plant at precise time and amount is still a problem. To identify the correct time and amount of water and fertilizers, it requires closed loop monitoring of the field. **Smart monitoring and automation in drip irrigation system is a smart way to get better results without increasing input costs yet increasing productivity, thus raising crop profitability.**

3. **Project GreenAI** through its PoC Smart Farms with Integrated Smart Irrigation Systems intends to introduce IoT Based Smart Drip and Sprinkler irrigation systems as the most efficient water and nutrient delivery system for growing crops. It delivers water and nutrients directly to the plant's root zone, in the right amounts, at the right time, so each plant gets exactly what it needs, when it needs it, to grow optimally. Water and nutrients are delivered across the field in pipes called 'dripper lines' featuring smaller units known as 'drippers' or through rain guns for various other varieties of crops.

4. **Overview. Two Smart Farms with 5 Acres area** each would be developed at a demarcated site at Koont Research Farms, Pir Mehr Ali Shah Arid Agriculture University (PMAS-AAUR) Rawalpindi. Soil moisture and other sensors would be placed near the root zone of the plant and gateway unit handles the sensor information and transmit data to the controller which in turns operates the flow control of water through the smart solenoid-operated valves. Supervisory automatic control systems like multi-terminal control systems are used in many processes, factors like soil, salinity, irrigation, temperature, light intensity, etc. needs repeated tasks and have to work in abnormal environmental conditions of the soil and to overcome the flaws in the existing system. Land is irrigated based on the soil moisture and at the same time the status of the irrigation is updated wirelessly to the based Android supported Apps. The proposed system will allow farmers to continuously monitor the moisture level and other parameters in the field, controlling the water supply remotely.

When moisture goes below a certain level, high-efficiency irrigation system (HEIS) i.e. drip/sprinklers/rain guns would be turned on automatically, thus achieving optimal irrigation using Internet of Things(IoT) enabled system. Developed system also enables the users to control their irrigation system from remote using a Mobile application/webserver-based interface

5. Through successful development of Smart Farms, following key objectives would be achieved: -

(a) Installation of IoT based wireless sensor network in the selected field(s) to sense data and to detect the deficiency of nutrients and moisture contents in the soil.

(b) Testing and development of intelligent decision support system that can track the soil condition, environment, GHG emission in the real time and thereby allow water and fertilizer to be dripped/supplied into the field as required through smart irrigation cum fertigation system.

(c) Development of mobile webserver interface to display and monitor the real time sensed data

6. This document, in the subsequent paragraphs, describes the system requirement specifications of the complete Smart Farm System for both the Drip and Sprinkler / rain gun Irrigation Systems. Subsequently, **Project GreenAI invites qualified and experienced firms to submit proposals** for the turnkey development and comprehensive solutions that will transform the allocated land of 10-acre area into a state-of-the-art Smart Farm by leveraging advanced technologies to enhance agricultural productivity, sustainability, and resource efficiency. The scope of work includes the design, supply, installation, integration, and commissioning of smart irrigation and fertigation systems, an extensive sensor network, a local weather station, a centralized control room with data center integration, reliable power systems, climate-controlled storage, and comprehensive security infrastructure. Proposals must address all outlined components, ensuring compatibility, scalability, and alignment with Project GreenAI's vision. Additionally, firms must provide external network services, including weather data subscriptions and secure data transmission to the central data center, for a minimum of one year.

7. The proposed system will cover a total area of 10 acres, comprising 5 acres of rain gun irrigation for field crops and 5 acres of drip irrigation for vegetable crops, and additionally one acre area will be allocated for operational and control room etc. **To facilitate a thorough understanding of the project scope and site conditions, a comprehensive field visit will be offered to all bidders, allowing them to assess technical requirements and gather essential details for proposal preparation.**

## SCOPE OF WORK

8. The scope includes, but is not limited to, the following components, described in detail in subsequent paragraphs : -

- (a) Electricity, Water System, Water Source & Storage
- (b) Drip Irrigation System
- (c) Raingun Irrigation System
- (d) Intelligent Fertigation System
- (e) IoT-Enabled Automation, Server-Based Data Collection, Storage and Display
- (f) Maintenance & Support
- (g) Technical Requirements

## 1. Electricity, Water System, Water Source & Storage

(a) The installation of the **transformer, electricity poles, and wiring** will be carried out in accordance with the **power consumption requirements of the project**. The power supply will be sourced from the **nearest connection point**, ensuring **proper load assessment and safety measures**. All electrical cables will be laid **underground** using **industrial-scale ducting** to enhance **durability, protection, and aesthetics**. The entire system will comply with **relevant electrical standards**, incorporating **surge protection, grounding, and insulation** to ensure operational efficiency and safety.

(b) Design and installation of a **solar power system and green metering** to ensure uninterrupted power supply for the entire smart farm. The system must be capable of meeting the project's energy demands, integrating efficient energy storage and load management. Additionally, **appropriate battery backup (min of 02 Hours)** for camera operations, control room and IoT is required to ensure uninterrupted operation during power outages.

(c) **02 High-pressure pumps** installed in parallel at main supply line (**01 for backup and 01 for Actual Ops**), designed to achieve maximum efficiency and selected based on precise head loss calculations, must be housed in a shed with proper design.

(d) The irrigation system will utilize water from the water reservoir (Located at Smart Farm Site) to ensure a reliable supply. **Water pumping system/Bore** to supply water from the water reservoir (RWH) and underground (if needed) to storage tank is included in scope of work.

(e) A comprehensive filtration unit must be integrated, including **sand filters, disc filters, and hydro cyclones**, to remove sediments and prevent clogging in drip irrigation lines. The filtration system should be designed based on the water quality and flow rate requirements to maintain system efficiency and longevity.

(f) A **high-capacity Reinforced Cement Concrete (RCC)** storage tank with a minimum capacity of **100,000–150,000** liters must be installed to meet the irrigation requirements of **10 acres**. The tank should be structurally reinforced, ensuring durability, weather resistance, and long-term sustainability. It must be integrated with the smart irrigation system for automated water level monitoring and efficient distribution. Additionally, the design should incorporate protective coatings to prevent water seepage and overhead or underground placement based on site feasibility.

(g) The construction of a **Galvanized steel Shed (Covered from three sides with 6 feet brick wall)** for storage, fertigation, and operations, with dimensions of **75' x 120' x 20'** and a **1-foot plinth**. Additionally, a fully furnished, **air-conditioned control room/office of 20' x 40' having 65" smart LED screen (cables & wires etc)** along with



**washroom and kitchenette, Storage room of 20' x 40'**, will be established, equipped with furniture and all standard compliance requirements.

(h) Furnished Big data repository display and monitoring center along with meeting room equipped with **three 65" smart LED screens (cables & wires etc)** (One for Dashboard, One for Surveillance, and One for meeting room) and **three inverter** air conditioners, each with a two-ton capacity and furniture including office tables and office chairs at PMAS AAUR.

(i) The entire farm must be enclosed with a **6-foot-high security fence** and at least two gated entrance access.

## **2. Drip Irrigation System (DIS)**

(a) Design and implementation over an area of 5 acres for vegetables crops.

(b) Location = URF (University Research Farm [Koont Research Farm])

(c) DIS should be divided into **4 Zones** with each zone covering **1.25 acres**, each zone must be equipped with both **manual and solenoid valve (battery/solar powered)** for flexible operation. Solenoid valves shall support **wireless communication** for remote operation and monitoring.

(d) DIS must support bed plantation for multiple vegetable crops.

i. Bed Width: 0.9 to 1.2 m

ii. Plant Spacing: 0.3 to 0.45 m

(e) Trenching depth for main/sub-main line: **1 to 1.25 m**.

(f) Trenching should be **properly marked and compact base**.

(g) Integration of DIS with an **intelligent and automated fertigation system**, with **soil moisture & environmental sensors** and with **automation & control system** (detail in Annex-I).

(h) The whole unit should be demonstrable for research data collection, automatic operation and centrally controlled.

(i) Remote operation and real-time monitoring of irrigation and fertigation schedules through an integrated smart control system.

(j) Head units must be hybrid for solar and main AC line with proper safety and gauging gadgets for solar power production/consumption analysis.

(k) High quality pipes, fitting, gauging and accessories should be incorporated i.e. PC emitted, field plugs for laterals, drip lateral rolling wheel/machine.

- (l) Standard material with proper specification, grading, make/model should use.

### 3. Raingun Irrigation System (RIS)

- (a) Design and implementation for **5 acres** (Field Crops) utilizing a minimum of 24 rain guns, with 4-5 operating simultaneously.
- (b) Location: University Research Farm, Koont
- (c) RIS should be divided into **6 Zones** and each zone must have 4 rainguns. Each zone must have two soil proximal sensors.
- (d) Each raingun must have a **solenoid valve (battery/solar powered)** and **manual option** for flexible operation. Solenoid valves shall support **wireless communication** for remote operation and monitoring.
- (e) RIS must support bed plantation for multiple vegetable crops.
- (f) Specifications include:
- i. Sprinkler spacing: **35 m**
  - ii. Effective wetted radius: **33 m**
  - iii. Trenching depth for main/submain line: **1-1.25 m**
  - iv. High quality pressure gauge for each rain-gun
  - v. Overall lapping should be 100%
  - vi. Quantity of raingun as per hydrants. Each hydrants should have its own raingun.
- (g) Whole units should be demonstrable for research data collection, automatic operation through solenoid valve and centrally controlled.
- (h) High quality pipes, fitting, gauging and accessories should be incorporated i.e. PC emitted, field plugs for laterals, drip lateral rolling wheel/machine.
- (i) High quality pipes, fitting, gauging and accessories with proper specification, grading, make/model should use.
- (j) Integration of RIS with an **intelligent and automated fertigation system**, with **soil moisture & environmental sensors and with automation & control system** (Details in IT Enabled Automation Section below)

### 4. Intelligent Fertigation System

- (a) A fully automated fertigation system must be integrated with both the Sprinkler Irrigation System (SIS) and Drip Irrigation System (DIS) to ensure efficient and uniform nutrient delivery. It must include:
- i. Fully programmable unit for real-time nutrient injections based on soil and crop requirements.
  - ii. Proportional dosing mechanism to ensure uniform nutrient distribution across 10 acres.
  - iii. Integrated with N, P, K, soil moisture, pH, and EC sensors for real-time adjustments.
  - iv. Controlled through a centralized dashboard and mobile application for real-

- v. time monitoring, scheduling, and adjustments.
- vi. Seamless integration with the irrigation control system for synchronized operation.
- vii. Prevents clogging and ensures longevity of the system.
- viii. Compatible with solar and grid electricity for uninterrupted operation.
- ix. Adjusts fertigation schedules based on real-time weather conditions and forecasts.
- ix. Captures usage data for performance analysis and research applications.

(b) The system must be rugged, scalable, and adaptable to support both research and practical farm applications at the University Research Farm, Koont. Vendors must specify make, model, dosing capacity, and additional technical specifications in their proposal.

## 5. IoT-Enabled Automation, Server-Based Data Collection, Storage and Display

(a) The configuration of the IoT-based Smart Farm with Automated Irrigation and Fertigation Control System integrates advanced soil and weather sensors, actuators, and a robust standalone IoT infrastructure to autonomously monitor environmental conditions and manage irrigation schedules, ensuring efficient water and nutrient delivery to crops. This system utilizes on-premises data storage, facilitating real-time data collection, analysis, and decision-making to optimize agricultural practices.

(b) The system features an intuitive, user-friendly responsive web-based dashboard interface that allows for seamless on-site control and monitoring, empowering users with precise insights into soil moisture, temperature, and nutrient levels. **Soil proximal sensors (Quantity 02) (7-in-1) will be strategically in each zone and calibrated to wirelessly transmit real-time soil moisture and nutrient data to the central system.** Weather sensors, including temperature, humidity, CO<sub>2</sub>, wind speed, and rainfall detectors, will be mounted on a centralized pole, synchronized with the dashboard for continuous environmental monitoring. Water volume sensors will be placed at source and distribution points, configured to track flow rates and trigger automated irrigation adjustments via Programmable Logic Controller (PLC) actuators based on AI-driven analytics.

(c) The CCTV surveillance system will be deployed with 360° HD cameras strategically placed in control rooms, fertigation and pump areas, machinery sheds, and fields, all linked to a secure storage unit with a three-month storage backup. 20 high-powered LED floodlights will be positioned alongside security cameras and configured for motion-based activation or scheduled nighttime operation. The centralized dashboard will be set up to aggregate sensor data, visualize real-time farm conditions, and provide manual override controls.

(d) To ensure uninterrupted connectivity, a high-speed wireless internet network will be established at the control room and field, utilizing Wi-Fi, LoRa, or cellular connectivity, depending on site conditions. All components will undergo rigorous testing, calibration, and synchronization before full activation, ensuring a highly responsive, automated, and data-driven agricultural management system for optimized productivity and resource efficiency.

(e) By leveraging automation, it reduces resource consumption and minimizes waste, promoting sustainable farming practices and improving crop yield.

(f) The system should have the capability to integrate new features and sensors, as well as support data integration with various apps and services through APIs, ensuring

flexibility and scalability for future enhancements.

(g) In addition, the system prioritizes data security and system reliability, with all information securely stored locally, ensuring both privacy and operational continuity. This local hosting approach mitigates the risks associated with remote data storage, ensuring dependable access to vital system controls, especially in areas with limited connectivity. The primary aim is to enhance agricultural productivity while promoting environmental sustainability and economic efficiency.

(h) **Component Specifications.** These are described in undermentioned paragraphs: -

#### **A. IoT Based Infrastructure for Environmental Monitoring**

Uses various IoT based soil and weather sensors to monitor farm conditions such as drip irrigation, rain gun irrigation, temperature, humidity, soil moisture, and crop health. Wireless communication (Wifi, LORA, 4G and other advanced technologies) is used to transfer data to a Gateway. Acts as a bridge between IoT devices and the Smart Farm Server.

##### **1. Soil Moisture Monitoring:**

(a) **Sensor Type:** Soil moisture sensors.

(b) **Function:** Measure the volumetric water content in the soil to decide irrigation scheduling.

##### **2. Temperature & Humidity Monitoring:**

(a) **Sensor Type:** Temperature and humidity sensors.

(b) **Function:** Measure ambient temperature and relative humidity for better environmental control.

##### **3. Rainfall Monitoring:**

(a) **Sensor Type:** Tipping bucket rain gauge.

(b) **Function:** Detect rainfall to prevent unnecessary irrigation during rainfall events.

##### **4. Soil pH Monitoring:**

(a) **Sensor Type:** Soil pH sensors.

(b) **Function:** Monitor soil pH for determining the suitability of soil for different crops and controlling nutrient levels.

##### **5. Soil Electrical Conductivity (EC):**

(a) **Sensor Type:** EC sensor.

(b) **Function:** Measure soil salinity to assess fertilizer application needs and prevent soil salinization.

##### **6. Light Intensity Monitoring:**

(a) **Sensor Type:** Light-dependent resistors (LDR) or photodiodes.

- (b) **Function:** Measure sunlight exposure, crucial for determining the growth conditions for crops.
7. **Weather Station Integration:**
- (a) **Function:** Integrating local weather data (temperature, humidity, wind speed, solar radiation, and precipitation) to adjust irrigation and fertigation schedules.
- B. Irrigation Control**
1. **Automated Irrigation:**
- (a) **Function:** Control irrigation through sprinklers and drip systems.
  - (b) **Trigger:** Based on soil moisture, temperature, and scheduled time.
  - (c) **Manual Override:** Allows remote manual intervention via the web interface.
2. **Flow & Pressure Monitoring:**
- (a) **Sensor Type:** Flow meters and pressure sensors.
  - (b) **Function:** Detect abnormal water flow or pressure issues in the irrigation system.
- C. Fertigation Control**
1. **Automated Fertilizer Application:**
- (a) **System:** Fertigation unit integrated with the irrigation system.
  - (b) **Components:** Fertilizer tanks, pumps, and injectors.
  - (c) **Control:** Mix water and fertilizer in precise proportions and inject into irrigation lines.
2. **Nutrient Monitoring:**
- (a) **Sensors:** Nitrate, phosphate, potassium, and other relevant nutrient sensors.
  - (b) **Function:** Monitor soil or water nutrient levels and adjust the fertigation mixture accordingly.
  - (c) **Control Mechanism:** Automated based on soil test results or real-time nutrient sensor feedback.
3. **pH Adjustment in Fertigation:**
- (a) **Sensors & Pumps:** Monitor and adjust the pH of the nutrient mix to optimal levels using acid/base solutions.
4. **Variable Rate Fertilization (VRF):**
- (a) **Function:** Vary fertilizer doses based on crop needs, soil type, and specific growth stages.
  - (b) **Control:** Dynamic adjustments based on sensor data.

## **D. On-Premises Standalone App, Database and Storage Server for Data Collection and application**

### **1. Real-time Data Logging:**

(a) **Function:** Collect and store sensor data such as soil moisture, temperature, pH, EC, water flow, etc.

(b) **Storage:** Use a centralized standalone on-premises platform for data storage, analysis, and historical record-keeping.

### **2. Predictive Analysis:**

(a) **Machine Learning:** Use predictive models to forecast irrigation and fertigation needs based on weather data, soil conditions, and crop growth stages.

### **3. Reporting:**

(a) **Function:** Generate daily, weekly, or monthly reports on water usage, fertilizer consumption, and crop health.

(b) **Access:** Allow users to export reports for further analysis or compliance.

### **4. Automated Decision-Making:**

(a) **Function:** Based on sensor data and machine learning predictions, automatically adjust irrigation and fertigation schedules.

## **E. Web & Mobile Interface**

### **1. Remote Monitoring:**

(a) **Function:** User can access and monitor system status (e.g., moisture levels, irrigation schedules, fertigation details) via a web portal or mobile app.

### **2. User Control:**

(a) **Function:** Allow users to modify irrigation schedules, activate manual irrigation, or **adjust** fertigation settings remotely.

### **3. Real-time Alerts and Notifications:**

(a) **Types:** Low moisture, high temperature, failed irrigation or fertigation, sensor errors, rainfall alerts.

(b) **Channels:** Email, or push notifications.

### **4. User Interface:**

(a) **Function:** Display live data on dashboards with charts, graphs, and maps for easy **monitoring** and decision-making.

(b) **Access Control:** Multiple user access with role-based permissions (e.g., farm manager, worker, agronomist, Administrator).

**F. Sensor Deployment & Configuration:** Soil Sensors (Quantity 02) (7-in-1) will be strategically installed across each zone to continuously measure soil moisture, temperature, and nutrient levels. They will be configured to transmit real-time data

wirelessly to the central control unit. Weather Sensors will be mounted on a centralized pole to capture temperature, humidity, CO<sub>2</sub> levels, wind speed, and rainfall data, transmitting information to the dashboard for climate analysis. Water Volume Sensors will be installed at main sources and distribution points, tracking water usage and triggering automated irrigation adjustments based on soil moisture and weather conditions.

**G. Surveillance & Security System Setup:** CCTV Cameras will be installed in control rooms, fertigation areas, pump stations, machinery sheds, and fields. Field cameras (360° HD) will provide real-time video feeds to the control room dashboard and store recordings for up to three months. 20 high-powered LED floodlights will be placed alongside field cameras and critical locations to enhance security, automatically activating at night or based on motion detection.

**H. Data Processing & AI-Powered Decision Making (DSS):** A Smart Irrigation Decision Support System (DSS) leverages advanced sensors, data analytics, and predictive algorithms to optimize irrigation and fertilization processes. The system collects real-time data from various sources, such as soil moisture sensors, weather forecasts, and crop health monitors. By analyzing this data, the DSS predicts the irrigation and fertilization needs based on factors like crop type, growth stage, soil conditions, and water availability. Using this analysis, the system provides actionable insights and recommendations for efficient water use and nutrient management. It ensures that irrigation and fertilization are carried out at the optimal times and in the correct amounts, preventing over- or under-watering, and ensuring that crops receive the right nutrients at the right time. This results in resource conservation, improved crop yield, and sustainable farming practices.

- Uses latest AI algorithms for model training (Rule Based AI, ML, DL).
- Provide full access to the source code and a distribution license.
- The client will have full rights to modify, sell, and customize the software freely.
- The code should not be encrypted or locked, allowing modifications.
- The agreement must clearly state that procuring agency owns the copyright.

**J. Web Based User Dashboard Interface for Monitoring and Controlling Farm Operations :** A central dashboard will visualize real-time sensor data, weather conditions, water usage, and security footage. The application will allow users to monitor and control the system remotely, providing alerts for soil conditions, weather changes, irrigation needs, and security threats. Secure data encryption ensures that all transmitted and stored information is protected from unauthorized access.

**K. Network & Connectivity:**

The system will be connected via high-speed internet provided at the control room and field to enable seamless data exchange. Wireless communication protocols (Wi-Fi, LoRa, or cellular networks) will be used to ensure reliable sensor connectivity over long distances.

## **6. Maintenance and Support**

(a) Regular system inspections and sensor calibrations (for one year), including monthly checks on sensors, controllers, valves, and pumps to ensure accurate operation.

- (b) Calibration of soil moisture, weather sensors, pH, EC sensors, and digital flow meters every three months or as required.
- (c) Quarterly preventive maintenance visits (One year) by trained technical personnel, with on-demand service visits available for unexpected issues.
- (d) Regular software and firmware updates for the irrigation control system, fertigation software, and server-based monitoring application, including performance optimization patches.
- (e) Hands-on training during system installation covering operation of irrigation controllers, fertigation system, server-based dashboard, and mobile app (Three-day intensive training: one day theoretical, two day practical).
- (f) Post-installation training must be conducted one month after installation, including two-day training on system maintenance, troubleshooting, and best practices.
- (g) One-year technical support, including 24/7 remote assistance for troubleshooting, issue resolution, and software/hardware concerns.
- (h) Guaranteed availability of spare parts for at least five years after installation.

## **7. Technical Requirements**

Proposals must address the following specifications:

### **1. Detailed Drawings and Flow Diagrams**

- (a) Provide complete schematic diagrams illustrating the design, integration, and connectivity of each system, including:
  - (b) Layout with main and sub-main pipelines, valve placements, emitter spacing, filtration units, and pumping stations.
  - (c) Design showing nozzle placements and operational range.
  - (d) Flow diagram depicting automated nutrient injections, fertigation scheduling, and integration with the irrigation system.
  - (e) Sensor placement for soil moisture, temperature, EC, pH, and environmental conditions, including connectivity with the control unit.
  - (f) Layout with hardware and software components, power supply design, communication infrastructure, and user interface.
  - (g) All the operations, maintenance and repair manuals developed for the complete system and accepted by the procuring agency.

### **2. Technical Specifications of Each Component/System**

- (a) Pipe diameter, material composition, and pressure rating for irrigation pipelines.
- (b) Solenoid valve specifications (wireless, battery/solar-powered, response time, and control range).
- (c) Pump capacity, efficiency, and operational flow rates.
- (d) Filtration system type, filtration efficiency, and maintenance schedule.
- (e) Sensor details (measurement accuracy, calibration frequency, communication protocol).
- (f) Smart controllers, software compatibility, and integration with cloud-based



platforms.

### 3. **Detailed Bill of Materials (BoM)**

(a) A comprehensive list of all required components should be included in **Financial proposal**, including:

- i. Itemized breakdown of each system component with technical specifications.
- ii. Quantity, unit price, and total cost estimates.
- iii. Manufacturer details, make, and model number of critical components.
- iv. Compliance with relevant quality standards (ISO, ASABE, etc.).

### 4. **Miscellaneous Requirements**

(a) All system components, including solenoid valves, piping network, pumps, filters, fertigation injectors, control systems, IoT sensors, and dashboard software, must be covered under a one-year warranty, ensuring free repair or replacement of faulty components.

(b) A comprehensive manual must be provided, covering system configuration, operation guidelines, troubleshooting procedures, maintenance schedules, safety protocols, software usage, and a spare parts list with replacement instructions.

(c) Proper labelling and tagging of each system and component with its specifications for better demonstration

## **.PREPARATION OF PROPOSAL**

### 1. Format of the Technical Offer is as follows:

- (i) All Forms and applicable Annexures completed & signed with no information missing.
- (ii) **Company Profile** - Provide a thorough description of the Bidder's business, expertise, developed products / services, mission and how this proposal is compatible with the Bidder's overall business objectives.
- (iii) Design & Development Plans
  - (a) A full description of the proposed solution (category- wise) against requirements outlined in SRS-01 section (Annexure "A"), covering its complete features, design and development approach, project management approach and other information required to be evaluated, as mentioned in the Evaluation Criteria (Annexure "B").
  - (b) Include specifications and data for meeting all the technical requirements in SRS-1 (Annexure "A").
  - (c) Supporting content in the form of Gantt Charts, Software Architecture Diagrams, Block Diagrams, HR deployment plan / lists, Module Dependencies over other modules, etc to be attached with the plans to make the proposal comprehensive.

### 2. A description of the complete design, as well as a basic description of all the components / systems / sub-systems / parts, testing, integration, deployment, operations, maintenance, and user training.

### 3. **Supporting Material**

- (i) Supporting material may include diagrams, reference models (literature consulted, brochures, company agreements etc as per requirements of the Evaluation Criteria.
- (ii) All soft copies (that cannot be printed) shall be submitted on a USB drive as part of the technical proposal.
- (iii) A list of all media/soft items submitted on the USB drive shall be attached in print form with the Technical Proposal.

### 4. **Human & Technical Resources**

- (i) A description of the relevant experience of key team members dedicated for the project module is to be given in Form A-5.
- (ii) A description of the relevant technical resources in Form A-5 of the RFP.

(iii) The purpose of this section is to show that the Bidder has enough expertise to complete the project.

(iv) It is the bidder's responsibility to make sure that all human resources committed to be deployed on the project, either part time or full time, actually works on the project as per the commitments made in the proposal. During project execution, the procuring agency reserves the right to interact directly with the project HR to ensure that the desired resources and team size is working on the project as per the commitments made by the bidder. Violations if any would be recorded in writing and in case of delays in delivery of milestones or end products, decision on L/D charges would be made accordingly.

**(v) The proposed team members would be engaged upon mutual consent of both the parties with PD GreenAI as final authority.**

## 5. Additional information

Bidders may include any additional information or documentation they deem necessary.

6. The Technical Proposal Envelope shall contain the following:

- (i) Form A-1 Letter of Proposal dully filled and signed by authorized signatory
- (ii) Form A-2 Bidder's General Data Information Form
- (iii) Form A-3 Professional Profiles for Key Resources
- (iv) Form A-4 List of Specific Projects already delivered.
- (v) Form A-5 Professional Profiles For Key Resources
- (vi) Annexure D to Annexure F dully filled & signed by authorized signatory.
- (vii) Bid Security in the form described in Bidding Process Instructions.
- (vii) Letter of Authorization to sign the contract on behalf of the Bidder.
- (viii) All Digital media on a USB drive with list of contents attached in hard copy.

7. The Bidder will submit its Financial Proposal in the form as provided in **Annexure – C**. The Financial Proposal Envelope shall consist of one (1) original copy and one (1) duplicate hard copies. The original and duplicate hard copies of the Financial Proposal are required to have the signature of a duly authorized person of the Bidder with the Bidder's seal/ stamp.

8. Any Bid received by the procuring agency after the Deadline for Submission of Bids shall be rejected and returned unopened to the Bidder. Delays in the mail/courier, delays of person in transit, or delivery of a Bid to the wrong office shall not be accepted as an excuse for failure to deliver a Bid at the proper place and time. It shall be the Bidder's responsibility to determine the way timely delivery of its Bid will be accomplished either in person, by messenger or by mail/ courier.

## (LETTER OF PROPOSAL)

*[On Letterhead paper of the Bidder including full postal address, telephone no., fax no., e-mail address etc.]*

Dated \_\_\_\_\_

Project Director GreenAI  
NASTP Alpha 05,  
Old Airport Road, Rawalpindi

Email: pd@greenai.org.pk

Dear Sir,

1. Reference is made to the tender Enquiry No. \_\_\_\_\_.
2. Attached to this letter are documents listed below defining:
  - (a) The principal place of business.
  - (b) Duly filled-in all Proposal Forms along with required supporting documents and all other documents required to be submitted along with proposal.
3. We agree to abide by this Bid for a period of 90 days after the date fixed for technical proposal opening, or as extended, as per instructions given in RFP and it shall remain binding upon us and may be accepted at any time before the expiration of that period.
4. We have submitted the Bid Security for an amount provided for in the RFP which is part of our Bid, issued in accordance with the provisions of the RFP, along with our technical proposal.
5. If our Bid is accepted, we will submit the Performance Guarantee for the required sum on the form as provided for in the RFP issued in accordance with the provisions of the RFP.
6. The procuring agency reserves the right to annul the procurement process. Further, procuring agency may reject all bids or proposal at any time prior to award of contract without incurring any liability to the affected bidders or any obligation to inform the affected bidders of the justification for procuring agency' action.
7. The procuring agency and its authorized representatives may contact the following persons for further information, if needed:-

Contact 1	Tel:
Contact 2	Tel:

8. This Proposal is made with the full understanding that:
- (a) Bids will be subject to verification of all information submitted for Request for Proposal at the time of bidding.
  - (b) The procuring agency reserves the right to amend the scope and value of any Contract under this project.
9. The undersigned declare that the statements made, and the information provided in the duly completed Proposal are complete, true, and correct in every detail.

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Stamp & Signatures

---

(In capacity of)

Duly authorized to sign bid for and on behalf of

---

WITNESS:

---

Signature

Address \_\_\_\_\_

**BIDDER INFORMATION**

<b>Company Name</b>	
<b>Company Owner</b>	
<b>Company Registration</b>	
<b>Company Registration Date</b>	
<b>Company Address</b>	
<b>Workshop Address (if applicable)</b>	
<b>Phone Number</b>	
<b>Email Address</b>	
<b>Company Website (URL)</b>	

**Focal Person Details:**

<b>Full Name</b>	
<b>Position/Title</b>	
<b>City</b>	
<b>Phone Number</b>	
<b>Email Address</b>	
<b>Other Contact Info</b>	

---

(Name)  
(Designation)

## **PROFESSIONAL PROFILES FOR KEY RESOURCES**

### **Eligibility of Team Members (of the Bidder) working on the Project**

- (a) The individuals assigned to perform on the project should be the permanent employees of Primary Bidder Firm or are hired full-time for the study.
- (b) Undertaking of association of the individual (duly signed by the individual and company's CEO) that he / she is employed with the firm, is to be submitted by respective firms (else the marks will be deducted accordingly).
- (c) Please attach detailed CVs and attested copies of highest educational degree.

### **Eligibility of Consultants / Part Time HR working on the Project (May not be permanent members of the Bidding Company)**

- (a) Consultants and part-time HR deployed on the project must be mentioned separately along with the number of hours per week committed by that HR.
- (b) The proposed team members / part time HR / consultants would be engaged upon mutual consent of both the parties with PD GreenAI as final authority.
- (c) Please attach detailed CVs and attested copies of highest educational degree.
- (d) Part-time HR must give an undertaking that he/she is willing to spend the committed numbers of hours per week on the project. The certificate must be countersigned by the authorized signatory (CEO, Registrar) of the parent department in which the HR is currently working

**DETAILS OF PROJECTS COMPLETED / IN PROGRESS**

Name of Bidder: \_\_\_\_\_

S No	Project Title	Key deliverables	Finacial Value	Funding Source	Devlopment Duration	Current Status	Supporting Evidence / remarks

**\*Note:** Attach supporting evidence / documents for each of the listed projects.

\_\_\_\_\_  
(Name)

\_\_\_\_\_  
(Designation)



## PROFESSIONAL PROFILES FOR KEY RESOURCES

1. Resource Person Information

Name of Firm	
Name of Resource Person	
Proposed Position	
Highest Qualification	
Years of Experience	
Area(s) of Expertise	
PEC no: (applicable to engineers)	

2. Education:

[Summarize college/university and other specialized education of staff member, giving names of institutions, dates attended, and degrees obtained.]

Name of Institution	Degree Title	Year of passing

3. Key Skills:

[Give an outline of staff member's technical, soft, and hard skills that are pertinent to tasks assigned on this project. Use up to one page].

4. Professional Experience:

[Summarize professional experience in reverse chronological order]

Organization	Year	Position	Project / Assignment	Description of tasks performed by resource person

5. Certifications / Workshops and Short courses

[Enlist the certifications obtained, workshops and short courses attended that are pertinent to tasks assigned on this project]

6. Details of Tasks Assigned on this Project

7. Certificate

I, the undersigned, certify that to the best of my knowledge and belief, these biodatas correctly describe myself, my qualifications, and my experience.

\_\_\_\_\_  
Signature of Staff Member

\_\_\_\_\_  
Authorized official of firm

**\*Note:** Provide the details of all currently hired work force involve in this project including engineers, technicians as well.

## EVALUATION CRITERIA

1. The technical evaluation committee appointed by the Project Director GreenAI shall carry out its evaluation for the received proposals, applying the evaluation criteria mentioned hereunder.

### Mandatory requirements

2. All mandatory requirements / documents mentioned and demanded vide this RFP by the procuring agency are to be submitted. Moreover, the bidder is to fill all the forms and meet other proposal preparation requirements as given in **Annexure ‘A’** i.e. System Requirements Specifications. Procuring Agency reserves the right to disqualify a bidder in case if any desired documents / forms or data is found incomplete / missing.

### Detailed Requirements

3. Only the complete proposals submitted as per requirements of the bidding documents outlined in this RFP would be considered for evaluation. The detailed evaluation will be carried individually for each of the categories mentioned in the undermentioned table for compliance: -

Category	Evaluation Criteria	Remarks
<b>Technical Compliance</b>	Adherence to technical specifications, system design, and requirements as outlined in the SRS, Annexure ‘A’ of this RFP.	Mandatory Compliance with each of the provided specifications.
<b>Experience &amp; Past Projects</b>	Proven track record in designing and implementing smart irrigation systems.  Must have completed at least 02 Projects of similar nature within past 03 years.	Documented references and case studies must be submitted with the Technical Proposal.  Each of the submitted document / project details / case study / certificate would be duly verified by the Procuring Agency.
<b>Component Quality</b>	Quality of proposed materials, equipment, and accessories.	Must meet international and accepted industry standards.
<b>Automation &amp; Integration</b>	Level of automation, remote operation	Must comply with each of the requirement / specification.

	capability, and IoT integration.	Compatibility with existing infrastructure.
<b>Training &amp; Support</b>	Training plan, duration, and after-sales technical support	Min. 1-year support and on-site training as required.
<b>Warranty &amp; Maintenance</b>	Warranty duration and preventive maintenance plan	Min. 1-year warranty with service, maintenance and all related manuals as required.
<b>Project Timeline</b>	Realistic and efficient completion timeline	Completion of the entire project milestones as per the time schedule with minimum downtime for system deployment.
<b>Sustainability Aspects</b>	Solar integration, energy efficiency, and environmental impact.	Complete proposal with worked out wiring diagrams, proposed power distribution, load distribution and execution plan with all the concerned agencies must be submitted and would be evaluated. Green energy solutions preferred

4. **Solution Presentations.** Proposed Solution would be evaluated by a panel of experts nominated by Project Director GreenAI. The presentation would be held during the evaluation phase after opening of technical proposals, schedule would be announced by procuring agency after / on the opening date of technical bids. The presentation is to cover brief profile / experience of company in relevant domains, understanding of the project based on SRS, and capability of the firm to undertake such projects including prior experience. Furthermore, the Presentation should briefly elaborate the complete solution offered by the bidder along with technical specifications and status of compliance with the requirements mentioned in SRS and evaluation criteria. The presentation sessions are **mandatory and must be made exactly in accordance with the submitted technical proposal**. The hardcopy of the presentation is to be submitted during the presentation session and would be considered part of the technical proposal.

## FINANCIAL PROPOSAL FORM

1. TENDER INQUIRY No:
2. Time and Date of Opening :

(1)	(2)	(3)	(4)	(5)	(6)	(7)
S No	Item / Component	Description / Specifications	Cost in Fig	Sales Tax in Fig	Total Price in Fig	Total Price in Words

**Grand Total** \_\_\_\_\_ **Rs.**  
**In Words** \_\_\_\_\_

\_\_\_\_\_  
 (NAME)

\_\_\_\_\_  
 (DESIGNATION)

**Notes:**

1. Please add additional rows to mention unique cost elements not listed in the table.
2. All sub-modules and services, as applicable to the relevant category, must be quoted separately.
3. Taxes on Services like training, HR salaries / consultancy, Cloud services etc are to be quoted as per GoP rules.
4. Each cost element would be treated independently (as a separate service). The procuring agency reserves the right to drop any service out of the package offered (along with its cost element) and alternatively provide that to the successful bidder or decide not to use that at all (for example: Cloud hosting services, Data purchase service/cost etc).

\* Please fill "Annexure C(I)" for recording details of resource wise HR consultancies / part time HR only. **(May not be permanent members of the Bidding Company)**

**DETAILS OF THE CONSULTANCIES' COST FOR PART TIME EMPLOYEES /  
CONSULTANTS**

**Note:** The table is to be filled for all consultants / part-time employees proposed to be hired for the project.

Name	Position	Duration (months)	Rate (PKR) / month	Unit (number of hours/month)	Total Amount
<b>Consultants (Part Time)</b>					
Soil Expert				60	
Software				60	
Engr xxx				60	
xxx					
xxx					
<b>Grand Total</b>					

**Grand Total** \_\_\_\_\_ **Rs.**  
**In Words** \_\_\_\_\_

\_\_\_\_\_  
(Name)

\_\_\_\_\_  
(Designation)

**UNDERTAKING  
(Fill in and Return)**

**To**

**Project Director (Green AI)  
Project Management Unit  
Rawalpindi**

**Dear Sir,**

I/We hereby submit our bid to supply “**Design & Development of** of 10 Acres GreenAI Smart Farm on Turnkey Basis” detailed in the SRS as you may specify in the contract at the prices given in Annex “C” and further agree that this bid will remain valid up to 90 days from the date of bid opening and will not be withdrawn or altered in terms of rates quoted and the condition stated therein on or before this date.

I/We understood the instructions to Tenders and condition of contract as laid down in tender document and thoroughly examine specification / drawing and / or patterns quoted in the Schedule to Tender and am/are fully aware to the nature of the goods required and my/our offer is to supply goods strictly in accordance with the requirements.

**Witness’s Signature:**

Name:  
N.I.C No.  
Address:  
Date:

**Signature of Bidder:**

Name:  
N.I.C No.  
Capacity in which Signing:  
Address:  
Date:  
Tel: Telex/Fax

**NON-DISCLOSURE AGREEMENT (NDA) OF  
CONFIDENTIAL INFORMATION**

Except as required to further the relationship between the procuring agency and M/s or as expressly authorized in writing on behalf of procuring agency, M/s \_\_\_\_\_, its shareholders/partners, directors, advisors, officers, and employees shall not disclose, provide or share directly or indirectly by any mean (verbal, writing, social media), any Confidential Information (partial or complete) during the period of his/her relationship with the procuring agency or any time after the termination of such relationship.

Signed

Signed

Bidder

Bidder

Dated:

Dated:

**CERTIFICATE FOR CORRECTNESS OF  
DATA / DOCUMENTS / INFORMATION**

(Date:.....)

It is certified that the data/ documents/ information submitted in our Proposal is absolutely correct to best of our knowledge and we accept full responsibility for its accuracy.

We understand that any false or incorrect data/ documents/ information may result in disqualification of our bid at any stage of procurement process.

Signature of Authorized Representative: \_\_\_\_\_

Name/Designation of Authorized Representative: \_\_\_\_\_

Designation of Authorized Representative: \_\_\_\_\_