



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

REQUEST FOR PROPOSAL

GREENAI-AAUR-SMARTFARM AND GREENCABIN/RFP03/2025

FOR

**REQUEST FOR PROPOSAL FOR DESIGN, SUPPLY, INSTALLATION
AND OPERATIONALIZATION OF FULLY FUNCTIONAL SMART GREEN
HOUSE (CABIN) & SMART FARM ALONG WITH ALL NECESSARY
SERVICES 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: **18 March, 2025**

1. The procuring agency invites sealed bids from Firms, companies registered with Income Tax and Sales Tax Department for “Design, Supply, Installation and Operationalization Of Fully Functional Smart Green House (Cabin) & Smart Farm Along With All Necessary Services 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/-.
3. Bids prepared in accordance with instructions in the bidding document must reach at following address on or before **08 April, 2025 at 1100hrs**. Bids will be opened on same day **08 April, 2025 at 1130hrs** in presence of bidders or their authorized representatives.

Project Director (GreenAI)
NASTP, Alpha 03,
Old Airport Road, Rawalpindi
Email: pd@greenai.org.pk

Date:- **18 March, 2025**

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.

HBL		HABIB BANK حبیب بینک		Deposit Slip Customer Copy	
Branch:				Date: 20 02 20 25	
Account Title: اکاؤنٹ ہولڈر کا نام <i>Public Procurement Regulatory Authority Islamabad</i>					
IBAN: آئی بی این		PK H A B B 0 0 0 4 5 4 0 0 1 3 1 0 6 7 0 1			
Currency: <input type="checkbox"/> PKR <input type="checkbox"/> USD <input type="checkbox"/> EURO <input type="checkbox"/> GBP <input type="checkbox"/> JPY <input type="checkbox"/> Others				<input type="checkbox"/> Intercity <input type="checkbox"/> Within city <input type="checkbox"/> Same Branch	
Credit Card No. - - - - -					
<input type="checkbox"/> CASH نقد					
BANK / BRANCH		CHEQUE/INSTRUMENT NO. چیک نمبر		AMOUNT رقم	
		3619368		90,000/-	
TOTAL AMOUNT				90,000/-	
Total Amount in Words: <i>Ninety Thousand only.</i>					
Commission (if any)					
Depositor's Name: <i>M. Adnan</i>					
Contact No. <i>0321-5157370</i>					
Depositor's CNIC No. <i>17201-6524320-7</i>					
Depositor's Account No.					
Received By: <i>[Signature]</i>		Depositor's Signature: <i>[Signature]</i>		<i>[Signature]</i>	
34568405					
(0602) HABIB BANK LIMITED CDA Civic Centre, Islamabad					
(As per Terms & Conditions on reverse) (Not official unless validated)					

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BIDDING PROCESS INSTRUCTIONS

1. **Bid Reference No.** GREENAI-AAUR-SMARTFARM AND GREENCABIN/RFP03/2025

2. **Procurement Agency**

Ministry of Defence through the Project Director of its GreenAI Project Management Unit.

3. **Invitation of Bid**

Procuring Agency incites sealed bids for “Design, Supply, Installation and Operationalization Of Fully Functional Smart Green House (Cabin) & Smart Farm Along With All Necessary Services On Turnkey Basis” during financial years 2025-26 as per RFP.

4. **Last Date & Time of Submission of Bid:** 08 April, 2025 at 1100hrs

5. **Bid Opening Date & Time:** 08 April, 2025 at 1130hrs

6. **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

7. **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.

8. Procurement Procedure

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

9. 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.

10. 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: -

- Technical Proposal as per System Requirement Specifications **Annexure 'A'**
- Bidding Forms & **Annexure 'D' to Annexure 'F'** (Duly filled & signed by authorized signatory)
- Bid Security in a separate sealed envelope clearly marked **Bid Security**, Tender Number.
- 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 duly 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.

11. **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.

12. **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:

- If there is a discrepancy between words and figures, the lowest amount, either in words or figures, shall be considered.

- 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.

- 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.

- 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.

- 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.

13. **Consultancy**

A minimum of 03 consultants (precision agriculture, digital agriculture and civil works/engineering) / 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.

14. **Bidder's Eligibility**

Bidders must fulfill all the requirements as per the eligibility criteria provided in these bidding documents. Otherwise, the bidders will be disqualified, and their bids will not be considered for further evaluation

15. **Bid Security**

(a) Bid security will be equal to **Rupees 500,000/-** 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:

- To furnish Performance Guarantee in accordance with the RFP document; and
- 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*

S. No	Conditions	Payment to be made
1.	Signing of Contract Mobilization Advance: 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 Over And Above The Requirements of RFP.	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.	20%

	The operations would be monitored and demonstrated to the Tech Team of the procuring agency.	
5.	Delivery and acceptance of: <ul style="list-style-type: none"> • Final design documents, manuals and drawings as per component 7 of the SRS (Technical Requirements) (Min 05 hard copies) • Complete software package / programs / codes • Project completion report • Training of technical staff • Acceptance / completion certificate issued by the user 	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 Seven (07) 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 GreenAI 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 GreenAI (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. Affidavit

Affidavit on Stamp Paper to the effect that the firm has not been blacklisted and debarred by any government/semi government/autonomous body or company

28. **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.

29. **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.

30. **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.

31. **INTELLECTUAL PROPERTY RIGHTS**

Bidder is to certify to transfer IP rights to the purchaser which include but not limited to ideas, inventions, discoveries, tools, methodology, computer programs, processes and improvements. The transfer of IP also includes the finally developed Greencabin, Smart Farms and all services including software, designs, component or part that has been designed, developed, manufactured, assembled, tested or installed in the Greencabin and Smart Farm. In addition, any other intellectual property, tangible or intangible, that has been created by the bidders or OEM's will be transferred to Project GreenAI.


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

Date:- 18 March, 2025

SYSTEM REQUIREMENTS SPECIFICATIONS (SRS-01)

“DESIGN, SUPPLY, INSTALLATION AND OPERATIONALIZATION OF FULLY FUNCTIONAL SMART GREEN HOUSE (CABIN) & SMART FARM ALONG WITH ALL NECESSARY SERVICES ON TURNKEY BASIS”

INTRODUCTION

GreenAI, a PSDP-funded project, invites qualified firms and vendors to submit proposals for the “Design, Supply, Installation and Operationalization of Fully Functional Smart Green House (Cabin) & Smart Farm Along With All Necessary Services On Turnkey Basis” at PMAS-Arid Agriculture University, Attock Campus. **Spanning 12 acres**, the project will include **5 acres of rain gun irrigation** for field crops, **5 acres of drip irrigation** for vegetable cultivation, **1 acre dedicated to the Green Cabin**, a high-tech hydroponic system, and **1 acre allocated for parking, administrative offices, operational facilities, and control rooms** etc. **2D Plan of Civil Work (Tentative Plan), Entomology Report, ERM Survey Report, Soil Characteristics and Water Quality report** can be collected from the Dy PD Office GreenAI, PMAS-Arid Agriculture University Rawalpindi. **It must be ensured that all sensors used in Greencabin and smart farms and other areas are of EU/American Standards with proper certified calibrations.**

Scope of Work: The scope includes, but is not limited to, the following components:

Section A

Services (Civil Work (Pre-fab structure will be preferred), Furniture, Electronic Appliances, Electricity, Water Boreholes, Solar Power, Water Storage Tank, Fencing, Internet, Branding, Landscaping, Drainage etc.)

1. Installation (approval from WAPDA and etc.) and fully functional **transformer, electricity poles, and wiring** will be carried out in accordance with the **power consumption requirements (to be calculated by the bidders) of the project**. The power supply will be sourced from the **nearest connection point (approximately 3100 feet away from the site)**, ensuring **proper load assessment and safety measures**. All electrical cables after the transformer will be laid **underground (as per standard specifications)** 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.
2. Design and installation of a **hybrid solar power system** to ensure uninterrupted power supply for the entire project (Offices, Smart Farm Operations, Water Pumping etc, and Green Cabin Operations). 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 03 hours)** for camera operations, control room and IoT to ensure uninterrupted operation during power outages/nighttime.
3. **Two separate water boreholes** will be done, to ensure a **continuous and reliable water supply** for the **Smart Farm and Green Cabin**, each strategically positioned to meet the specific irrigation and operational needs of the facility. These boreholes will function as **primary water sources**, equipped with **02 high-efficiency water-cooled submersible pumps** (Should be able to fill water tank of 250,000 liters in 2.5-5 hours

minimum) to provide a **consistent water flow** for refilling storage tanks. The bore will supply water to the **200,000–250,000-liter reinforced cement concrete (RCC) storage tank**, ensuring uninterrupted operation of **rain gun, drip irrigation systems and hydroponic system**. The system will be integrated with **automated water level sensors** to regulate refilling and prevent overflows or shortages.

4. A **high-capacity Reinforced Cement Concrete (RCC) underground storage tank** with a **minimum capacity of 200,000–250,000 liters covered with 3 feet tilted fence and barbed wire above the ground with Galvanized Iron** must be installed to meet the irrigation demands of the **10-acre Smart Farm and 1-acre Green Cabin**. The tank should be **structurally reinforced** for enhanced durability, weather resistance, and long-term sustainability. It must be seamlessly integrated with the **smart irrigation system**, enabling **automated water level monitoring and efficient distribution**. To optimize functionality, the tank should feature **protective coatings** to prevent seepage and to be designed **underground placement**. Additionally, the tank must be **partitioned in at least 5 portions to ensure strength (but internally interconnected)**, to ensure a **dedicated water supply** for both the **Smart Farm and Green Cabin**. Furthermore, an **additional 50,000-liter or more underground RCC storage tank with epoxy based or food grade waterproofing coating, covered with RCC Slabs** will be required specifically for **purified water (connected with RO Plants output)** to support the Green Cabin's hydroponic system.

5. A **120' x 25' x 20'** with a **1-foot plinth** (Compact Surface with Tuff Tiles) **Parking Place** with its roof covered with **Solar Panels** to accommodate **operational activities**. The structure will ensure stability and durability. Additionally, **40' x 25' x 20' Galvanized Iron sheet** shed with a **1-foot plinth** is required alongside this space. Moreover, **12 (50W) LED lights**, **10 electric power switches** and **04 tap water facility** will be installed in this entire facility.

6. A **fully furnished, air-conditioned control & meeting room** measuring **25' x 40'** will be established to serve as the central hub for monitoring and managing **Smart Farm and Green Cabin operations (Pre-fab structure will be preferred)**. The control room will feature a **dedicated attached community washroom with all modern accessories (03 Toilets, 02 Shower, and 02 Sinks)** for convenience. Control room be equipped with **four interlinked 75" LED screens**, capable of functioning both **independently and as a synchronized system** (Video Wall Controller) for real-time data visualization and remote monitoring. A **large workstation table** with revolving chairs to accommodate **04 persons** for monitoring and surveillance is also required. Additionally, the space will include **Co-Working Space & Meeting Room** to accommodate **modern ergonomic furniture** (including **4 Workstations Table with Office Chairs**) and a **round/oval Conference/Meeting Table and Chairs (12 Persons)** **secure power backup, high-speed internet connectivity** to ensure seamless operations. The design will adhere to **all standard compliance requirements**, providing a **secure, efficient, and technology-driven** workspace for precision agriculture management. Adequate **lighting, a secure locking system, and fire safety measures (Fire Detection System & Sufficient Fire Extinguisher)** will also be incorporated to enhance security and functionality, ensuring seamless farm operations and inventory management. (**Appendix 'A'** Attached for Furniture/LED/other Details)

7. Additionally, a **30' x 60' storage room (Pre-fab structure will be preferred)** will be constructed to securely house **fertilizers, tools, agricultural gadgets, irrigation components, spare parts, and harvested produce (cereals and grains)**. The facility will be designed with **durable, well-organized shelving units and wall-mounted almirahs** to maximize space efficiency and ensure easy access to essential equipment. To maintain optimal storage conditions, the room will feature **proper ventilation**,

temperature and humidity control measures, and pest protection to prevent spoilage and contamination. Adequate **lighting, a secure locking system, and fire safety measures (Fire Detection System & Sufficient Fire Extinguisher)** will also be incorporated to enhance security and functionality, ensuring seamless farm operations and inventory management.

8. A **40' x 25' headroom (Pre-fab structure will be preferred)** adjacent to the GreenCabin will be constructed to house the **fertigation system, RO (Reverse Osmosis) plants, PLC Control, and fertigation tanks, misting system etc.** This facility will be designed to ensure **efficient nutrient and water management, featuring corrosion-resistant piping (Properly Covered & Labeled), automated dosing systems, and integrated control mechanisms** for precise fertigation. The headroom will include **adequate ventilation, drainage systems, reinforced concrete channels with steel covers for pipes and moisture-resistant walls** to prevent environmental damage and ensure equipment longevity. Adequate **lighting, a secure locking system, and fire safety measures (Fire Detection System & Sufficient Fire Extinguisher)** will also be incorporated.

9. A **20' x 20' packaging room (Pre-fab structure will be preferred)** will be established to efficiently handle and process **perishable commodities from the hydroponic system and high-value vegetable crops.** The packaging room will include a **pre-cooling and sorting area** to maintain freshness, **03 dedicated packaging stations** with stainless steel tables for hygienic handling, and **storage space for packaging materials.** The facility will also feature a **weighing and labeling section** for accurate product identification and tracking, along with a **proper drainage system** to maintain cleanliness and prevent moisture accumulation. **02 Thermal Units** will also be required to maintain the room temperature at optimum level. (**Appendix 'C'** Attached for Sorting Table/Tap water facility etc)

10. Two **fully furnished, air-conditioned offices (Pre-fab structure will be preferred),** each measuring **12' x 12',** will be constructed to accommodate the **Scientific Staff,** ensuring a comfortable and professional workspace. A **dedicated** attached **washroom with all modern accessories** for each office, to maintain hygiene and privacy. The offices will be equipped with **modern ergonomic furniture, including workstations desks, file cabinets** to facilitate research discussions and administrative tasks. (**Appendix 'A'** Attached for Furniture etc Details)

11. Two **fully furnished air-conditioned accommodation room (Pre-fab structure will be preferred),** measuring **15' x 18',** will be established for the **scientific staff,** providing a comfortable and functional living space. The room will be equipped with a **double bed with a high-quality mattress, a center table, and 5 Seater sofa** to accommodate visitors. Additionally, a **dedicated workstation desk and an ergonomic revolving chair** to facilitate research and documentation work. The accommodation will also have a **attached washroom measuring 6' x 8',** ensuring convenience and privacy for the occupants. The interior will be designed with **modern furnishings, and adequate lighting.** (**Appendix 'A'** Attached for Furniture etc Details)

12. A **15' x 18' worker facility room and accommodation area (Pre-fab structure will be preferred)** will be constructed to ensure the availability of at least two field workers for continuous farm operations, security, and system maintenance. It must be equipped with bunk beds or single beds, and essential furnishings (5 chairs). A **6' x 8' kitchenette** will be installed with a stove, sink, storage shelves, and a small refrigerator, allowing workers to prepare meals. (**Appendix 'A'** Attached for Furniture etc Details)

13. Project requires proper drainage system for the buildings and water waste

14. The entire farm must be enclosed with a **6-foot-high security fence** to ensure **protection against unauthorized access, stray animals, and external disturbances**. The fencing should be made of **galvanized steel mesh or barbed wire-topped chain-link material** for **durability and enhanced security**.

15. The CCTV surveillance system will be deployed with **CCTV cameras** according to strategically placed in head room, green cabin, fertigation, pumping 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. (**Appendix 'B'** Attached for Details)

16. To ensure uninterrupted connectivity, a **high-speed wireless internet network** will be established at the entire facility (headroom, control room, etc) utilizing **Wi-Fi. Additionally, LoRA, or cellular connectivity**, depending on site conditions will be required for sensors etc. 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.

17. Project requires a comprehensive **branding, and signage** for both **internal and external spaces** of the **Smart Farm and Green Cabin**. Large, professionally designed billboards and signboards with lights for nighttime, will be installed at the entrance, displaying the project name, logos, and key information, while **wall branding, vinyl stickers, and 3D logo signage** will be applied to glass doors, partitions, and key equipment to reinforce project identity. **Directional signboards and infographics** will be strategically placed for visitor and staff guidance. Additionally, all major machinery, fertigation systems, irrigation units, and storage areas will feature customized branding labels for easy identification and visual consistency.

18. **Paved walkways, ornamental plantations, and native flowering shrubs** will be strategically incorporated along entrances and pathways to enhance aesthetics and provide a welcoming environment. **Comfortable seating areas** will be installed for visitors, ensuring a pleasant and relaxing experience. Additionally, a **dedicated lawn with well-maintained turfgrass** will be established in front of the offices, further enhancing the visual appeal of the farm site.

Section B

Smart Farm (Water Pumping, Drip Irrigation System, Rain Gun Irrigation System, Fertigation System, Surveillance, and IoT-Enabled Automation, and Server-Based Data Collection etc)

1. Water Supply

a) **Two high-pressure pumps** will be installed in parallel at the **RCC storage tank**, with **one pump designated as a backup** to ensure uninterrupted water supply to smart farm. The pumps will be **carefully selected based on precise head loss calculations** to achieve **maximum efficiency** in delivering water to **Smart farms**. These pumps must be **energy-efficient, corrosion-resistant, and capable of handling variable flow rates** as per irrigation demands. To protect them from environmental factors and ensure **long-term operational efficiency**, the pumps will be housed in a **weather-resistant shed**, designed to facilitate **ease of maintenance and access for repairs**.

b) A **comprehensive multi-stage filtration unit** will be integrated into the system to ensure **clean, sediment-free water for drip and rain gun irrigation**. The filtration system will include **sand filters, disc filters, and hydrocyclones**, etc specifically designed to remove **suspended particles, debris, and contaminants**, preventing **clogging in drip irrigation lines** and ensuring **uniform water distribution**. The filtration capacity will be determined based on **water quality parameters and flow rate requirements**, ensuring **optimum system efficiency and longevity**. Additionally, **automatic backwashing and pressure monitoring mechanisms** will be incorporated to minimize manual maintenance and enhance system performance (Will be preferred).

2. Drip Irrigation System (DIS)

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

(i) Location = PMAS-AAUR Attock Campus

(ii) Key parameters include:

b) 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.

c) 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

d) Trenching depth for main/sub-main line: **1 to 1.25 m**

e) DIS should have flush valve system at the end of main, lateral, sub-lateral lines for cleaning purposes.

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**.
- 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) High quality pipes, fitting, gauging and accessories should be incorporated i.e. PC emitted, field plugs for laterals, drip lateral rolling wheel/machine.
- k) Standard material with proper specification, grading, make/model should use.
- l) Pipes Joints should be properly labeled.

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: PMAS-AAUR Attock Campus
 - (i) RIS should be divided into **6 Zones** and each zone must have 4 raingun. Each zone must have two soil proximal sensors.
 - (ii) 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.
- c) 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.
 - (vii) Whole units should be demonstrable for research data collection, automatic operation through solenoid valve and centrally controlled
 - (viii) High quality pipes, fitting, gauging and accessories should be incorporated i.e. PC emitted, field plugs for laterals, drip lateral rolling wheel/machine.
 - (ix) High quality pipes, fitting, gauging and accessories with proper specification, grading, make/model should use.

- (x) Pipes Joints should be properly labeled.
- (xi) 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) Seamless integration with the irrigation control system for synchronized operation.
 - (v) Prevents clogging and ensures longevity of the system.
 - (vi) Compatible with solar and grid electricity for uninterrupted operation.
 - (vii) Adjusts fertigation schedules based on real-time weather conditions and forecasts.
 - (viii) 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 PMAS-Arid Agriculture University-Attock Campus. 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 placed in each zone and calibrated to wirelessly transmit real-time soil moisture and nutrient data to the central system.** Weather sensors, including temperature, humidity, CO₂, lux meters, wind speed, wind direction 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 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.

d) 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.

Component Specifications. These are described in undermentioned paragraphs:

1. LoRA wan based IoT Infrastructure for Environmental Monitoring

Uses various LoRA wan 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 (LORA) is used to transfer data to a Gateway. Acts as a bridge between IoT devices and the Smart Farm Server.

(a) **Soil Moisture Monitoring:**

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

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

(b) **Temperature & Humidity Monitoring:**

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

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

(c) **Rainfall Monitoring:**

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

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

(d) **Soil pH Monitoring:**

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

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

(e) **Soil Electrical Conductivity (EC):**

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

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

(f) **Light Intensity Monitoring:**

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

(ii) **Function:** Measure sunlight exposure, crucial for determining the growth conditions for crops.

(g) **Weather Station Integration:**

(i) **Function:** Integrating local weather data (temperature, humidity, wind speed, solar radiation, and precipitation) to adjust irrigation and fertigation schedules.

2. Irrigation Control

(a) **Automated Irrigation:**

Control irrigation through sprinklers and drip systems. Based on soil moisture, temperature, and scheduled time. Allows remote manual intervention via the web interface.

(b) **Flow & Pressure Monitoring:**

(i) **Sensor Type:** Flow meters and pressure sensors.

(ii) **Function:** Detect abnormal water flow or pressure issues in the irrigation system.

3. Fertigation Control

(a) **Automated Fertilizer Application:** Fertigation unit with its components (Fertilizer tanks, pumps, and injectors) must be integrated with the smart irrigation system. Additionally, Fertigation system must mix water and fertilizer in precise proportions and inject into irrigation lines.

(b) **Nutrient Monitoring:**

(i) **Sensors:** Nitrate, phosphate, potassium, and other relevant nutrient sensors.

(ii) **Function:** Monitor soil or water nutrient levels and adjust the fertigation mixture accordingly.

(iii) **Control Mechanism:** Automated based on soil test results or real-time nutrient sensor feedback.

(c) **pH Adjustment in Fertigation:**

Sensors & Pumps: Monitor and adjust the pH of the nutrient mix to optimal levels using acid/base solutions.

(d) **Variable Rate Fertigation (VRF):**

(i) **Function:** Vary Fertigation doses based on crop needs, soil type, and

specific growth stages.

(ii) **Control:** Dynamic adjustments based on sensor data.

4. Human-Machine Interface (HMI)/Programmable Logic Control (PLC):

(a) The system shall include an HMI/PLC interface to allow users to control and monitor the farm and Green Cabinet operations in respective control rooms and in the main control room.

(b) The HMI/PLC shall provide real-time data visualization and control options for irrigation, fertigation's etc operations.

5. Data Logging:

(a) The system shall have capability to log all irrigation and fertigation activities, including water usage, nutrient delivery, and sensor data.

6. Scalability and Compatibility:

(a) The system shall be scalable to accommodate different farm sizes and types of crops.

(b) The system shall be compatible with various types of irrigation equipment and sensors.

7. Data Storage Server for Camera Footage Recording:

(a) The system shall include a data storage facility to record and store camera footage.

(b) The vendor shall provide an on-site server with at least **15TB Storage Capacity** to manage and store the recorded footage securely.

(c) The system shall support high-capacity storage to ensure sufficient space for long-term footage retention.

(d) The system shall offer scalable storage solutions to accommodate increased data volume as needed.

(e) The system shall provide a user-friendly interface for accessing, managing, and retrieving recorded footage.

8. System Integration:

(a) The system shall have the ability to connect with other systems for data logging and integration.

(b) The system shall support standard communication protocols (e.g., Modbus, MQTT) to enable seamless integration with third-party systems and platforms.

(c) The system shall provide Ethernet connectivity to ensure reliable and high-speed data transfer for integration and access.

9. 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/server. Weather Sensors will be mounted on a centralized pole to capture temperature, humidity, CO₂ 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.

Section C Green Cabin (Approximately 01 Acre)

Name of Items	Specifications	
<p>Green Cabin 01 Acre (Approximately)</p>	<p>1. Greencabin Structure. The green cabin skeleton is all produced by stereotyped molds and galvanized material. The connection of the skeleton is connected by galvanized bolts and self-tapping screws. The shape of the skeleton and the material specifications have been Carefully calculated. The wall thickness of various profiles is considered in addition to the strength and the rust and corrosion effects.</p> <p>Buffer room adjacent to green cabin 12x12 ft. Adjacent to greencabin equipped with insect zapper, racks for PPEs and shoes. Air sterilization system</p> <p>2. Material specification for structure of Greencabin (The maximum height of green cabin will be between 20 to 25 feet and width and length will be determined during survey): Column = 80 × 40 × 2.5; End column = 50 × 30 × 1.5; Gutter S1.8 * 500; Cross beam Φ32 × 1.5; Arch Φ32 × 1.5; PurlinΦ25 × 1.5; Inner diagonal brace Φ25 × 1.5;</p> <p>3. Standard as per international standard (from GB/T5237-93), Rubber seal. Connection parts: galvanized Fitting: Bolts, nuts, washers, self-tapping screws.</p> <p>4. Commercial Multi-Span EFTE Film for covering the Greencabin will be of thickness between 200-250 microns, must be with anti dust coating.</p>	
	Embedded parts	Specifications
	Main column HDG(hot-galvanizing)	100mm*50mm*2.0mm
	Hot Dipped Galvanized (HDG) Vice	50mm*50mm*2.0mm
	column:	
	HDG Span truss=metaphysical	50mm*50mm*2.0mm*500m
	HDG Side Wall beam	50mm*50mm*2.0mm
	"A" type beam =Hot-dip galvanizing tube	30mm*50mm*2mm
	HDG Outwards window column	100*50*2mm
	Rain gutter	3.0mm
	<p>Technical specifications</p> <ol style="list-style-type: none"> Greencabin ventilation cooling design Greencabin Structure Design Load Greencabin Engineering Terminology Design Specification for Greencabin Control System 	

5. Technical Specifications for Design, Construction and Acceptance of Greencabin Foundations
6. Compulsory provisions of engineering construction standards
7. Regulations on Construction Safety Production Management
8. The Environmental Protection Law of the Islamic Republic of Pakistan
9. Code for Acceptance of Construction Quality of Concrete Structures
10. Code for Acceptance of Construction Quality of Masonry Engineering
11. Code for Acceptance of Construction Quality of Building Water Supply and Drainage and Heating Engineering
12. Code for Acceptance of Construction Quality of Building Electrical Installation Engineering
13. Standards for Safety of Building Construction Inspection
14. Safety Technical Specifications for Temporary Electricity Use at Construction Sites
15. Safety Technical Specifications for Construction Work at High Heights
16. Technical data
 - (a) Wind resistance minimum **0.55KN/m²**
 - (b) Constant load minimum **0.19KN/PFM**
17. **Rain drainage 190mm / h water to be connected with water storage system**
18. Internal sunshade system. Internal and external Screening Sheet (grey color 50% light penetration) on complete structure be installed with necessary material pipes and allied accessories.
19. White aluminum foil shading net, motor transmission accessories
 - (a) External sunshade to meet lux requirement value of 25000 during sunshine hours. frame, black shading net, motor transmission accessories
20. Please note that the vendor will be responsible to prepare the necessary concrete foundation required to install the green cabin pillars etc. **The base floor of the greencabin of 01 Acre will be elevated by 1.5 ft above the ground level.**
21. The entire floor of 01 Acre of Greencabin will be of compressed soil to be covered by Mulch Sheet (Double sided black & white sheet) for entire cabin area.
22. Base columns will be constructed per design of Green cabin to properly hold the columns. Greencabin structure will be mounted on the base columns as per design requirements.
23. **The vendor will be responsible for proper design and careful installation of Greencabin structure and all components**

<p>Drip Irrigation, Intelligent fertilization system, RO Plant, Misting system</p>	<p>Smart drip irrigation system</p> <p>1. Smart drip irrigation system integrated with soil moisture sensor system will be installed to give water to the plants according to the plants water requirement. The vendor is responsible for proper and careful designing and installation of the Smart Drip Irrigation and integration with intelligent fertilization machine components and integrate with central control system. Bidder should attach design calculation with proposal.</p> <p>Intelligent fertilization system</p> <p>2. Intelligent fertilizer machine is used for mixing ratio of water soluble fertilizer to realize intelligent and scientific irrigation. It comes with pH/EC test Automatic water soluble fertilizer with three mixing drums of 2000 Litre capacity each.(Link with Serial No 14).</p> <p>Misting system</p> <p>3. Misting system in all Greencabin with 10-100 micron mist size and pump for maintaining pressure of 800 to 1200psi. It must have its own water tank of 1000 Gallons capacity.</p> <p>4. 2 RO Plants (4000 liters /Hour with Food Grade Dosage and 50000 liters storage Tank)</p> <p>5. Ambient Air: 1-45 °C</p> <p>6. Water Temperature: 1-45 °C</p> <p>7. Irrigation Pipe to be designed according to irrigation requirements and standards</p> <p>8. Quantity 12000 Pressurized Emitters with 1-2 BAR pressure with flow rate of 0.5- 1 GPH.</p> <p>9. Rain Drip sticks 12000 units</p> <p>10. Plastic tubing 2mm (12000 meter)</p> <p>11. Gutter Trays as per length of the gutter without any joint</p> <p>12. Irrigation pump as per design</p> <p>13. Drainage Pump as per design (Submersible pump Single phase, 2hp)</p> <p>Tanks for Recipe (3 No. Tough Plastic with Non- Corrosive coating, acid resistant, wide open mouth with lids) 2000 liter Capacity each.</p>
<p>Electrical Fixture and Sensor Network</p>	<p>Electrical panel for controlling of all the component of Greencabin as per following details.</p> <p>The system includes electrical control box, covered steel cable trough, cable and accessories, for complete electrical systems of the Greencabin.</p> <p>The electric control box is placed in the green cabin head room to facilitate the installation, commissioning and maintenance of equipment in the green cabin.</p> <p>Install waterproof and splash-proof sockets for electricity use in the control room and Greencabin</p> <p>Grounding system of copper wire with maximum five Ohms resistance to be installed for all electrical appliances in the Green cabin</p> <p>Grounding system of copper wire with maximum five Ohms resistance</p>

	<p>to be installed for all electrical appliances in the Green cabin.</p> <p>The vendor is responsible for proper and careful design and installation of the Electrical systems, sensor network along with associated cabling and all its components and then integrate it with central control system. Bidder is to attach electrical wiring diagram with proposal.</p>
Heating System	<p>Heating system is required which should ensure the green cabin temperature@15-20 degree centigrade during winter season. Electric Warm Fans along with conveying ducts/ heating distribution system/ or any other advanced systems for this purpose is required to be designed and submitted in the proposal.</p>
	<p>PLC (or advanced system) based intelligent and user friendly compact system is required which integrate all systems including but not limited to climate control, irrigation, Fertigation, Lux and all other systems control of the Greencabin. It should also include dual display on mobile/laptop and computer system. The system should also have back up to restore all data which can be utilized for further analysis. The data and control must be equipped with minimum 8 sensor sets (specifically used in Hydroponics), of EU or American origin, of each including temperature, humidity, precipitation, moisture, media temperature, NPK, EC, pH at all stages and steps including stock solution, irrigation solution, media and drain, CO2 etc. with duplicate display of Microsoft surface pro 7 or latest version. All data must be displayed at Greencabin control room and Control Room at PMAS AAUR Attock Campus with minimum 65 inch LCD.</p>
Intelligent Control	<p>Intelligent control system consist of following elements:</p>
	<p>Weather Station: Data to be retrived from system installed on the project.</p>
	<p>A weather station is essential for monitoring outdoor environmental conditions. It collects data on parameters such as:</p>
	<p>Temperature: Ambient air temperature.</p>
	<p>Humidity: Relative humidity (moisture content in the air).</p>
	<p>Light: Intensity of sunlight.</p>
	<p>Radiation: Solar radiation levels.</p>
	<p>Wind Speed: How fast the wind is blowing.</p>
	<p>Wind Direction: The compass direction from which the wind is coming.</p>
	<p>Rainfall: Precipitation amount. This data helps you make informed decisions for outdoor activities, agriculture, and safety</p>
	<p>Indoor Environment Sensor: (all sensors of EU/American origin are mandatory)</p>
	<p>Indoor sensors focus on maintaining optimal conditions within a controlled environment (like a greenhouse). They typically measure</p>

	NPK Levels: Nutrient levels (Nitrogen, Phosphorus, Potassium) for plant health
	pH: Soil or water acidity/alkalinity.
	EC (Electrical Conductivity): Indicates nutrient concentration in water.
	Humidity: Relative moisture in the air.
	CO2 Levels: Carbon dioxide concentration.
	Water Temperature: Temperature of water (important for hydroponics).
	Light (Lux): Illuminance level.
	Indoor Temperature: Ambient air temperature. Placing sensors at minimum 3 points in the greenhouse ensures accurate monitoring
	Greenhouse Control Software/Intelligent cabinet:
	This software automates, manages and transmits data of various greenhouse systems to cloud of GreenAI
	Shading System: Automatic adjusts shading to control light exposure.
	Cooling System: Automatic regulates temperature by managing ventilation, fans, and cooling pads
	Irrigation System: Automatic schedule the irrigation according to water requirement.
	Heating System: Automatic regulates heating in winter by observing outdoor and indoor temperature of green cabin
	Sunlight System(lux): Controls natural light entry.
	Data Collection: Automatically records environmental data (temperature, humidity, etc.). Generates reports and graphs of data for further analysis.
	Remote Monitoring: Allows you to remotely monitor the greenhouse from a mobile device or computer The vendor is responsible for proper and careful installation of the sensors and all components and integrate with central control system for realizing intelligent system.
	Note: Bidder must also submit technical and financial proposal of Hoogen Doorn Intelligent Control System version IIVO etc or latest compatible with this Greencabin System
UV-C System for Airborne Pathogen Control	UV-C System for Green Cabin UV-C Light System for Airborne Pathogen Control in a 1-Acre Hydroponic Greenhouse Using UV-C (Ultraviolet-C) light is an effective method to eliminate airborne pathogens, mold, and bacteria in an enclosed hydroponic greenhouse. The right specifications ensure optimal coverage, safety, and efficiency without harming plants or humans.

	<p>UV-C Light Specifications (For 1-Acre Greencabin)</p> <p>(a) Wavelength & Intensity</p> <p>(i) UV-C Wavelength: 253.7 nm (Most effective for pathogen destruction).</p> <p>(ii) Minimum Intensity: >10,000 µW/cm² (at source) for effective disinfection.</p> <p>(b) Total UV-C Power Required</p> <p>(i) Air Disinfection Requirement: 0.2–0.4 W per cubic meter.</p> <p>(ii) Greenhouse Volume (Approx.):</p> <ul style="list-style-type: none"> • Area: 1 acre (43,560 sq. ft.). • Height: 20 ft average. • Total Volume: 871,200 cubic feet (~24,670 cubic meters). • Total UV-C Power Needed: 5,000 - 10,000 W (5-10 kW) for full air circulation disinfection. <p>(c) Recommended UV-C Fixtures: To ensure even distribution and complete pathogen elimination, use of fixed Ceiling fixtures are recommended of 150-200 W per unit with installation of 25-30 units.:</p> <p>UV-C Exposure Time & Safety: Recommended Exposure Time is of 15-30 minutes per section (if used at night). It must have Automated Scheduling with operation during non- working hours to avoid exposure risks. It must have Shielding by use of reflective surfaces (e.g., aluminum-coated panels) to enhance UV-C efficiency</p>
Fan Circulation System	Fan circulating system is required to be designed to improve uniformity of temperature, humidity, CO2 concentration etc. It must include size and quantity of fans to achieve improved uniformity.
Lighting system	LED grow lights of 500-650 nanometer wavelength (or advanced options) along with wavelength controller are required to be designed and installed, in order to improve photosynthesis to 18 hours a day. PAR Meter is also to be provided along with the Grow Lights. Calculation for number of Grow lights is to be submitted in the technical proposal.
Green House Machinery	<ol style="list-style-type: none"> 1. 03 Carts (hydraulic, automatic, adjustable with height of 20 ft) 2. 15 Sulfur Heaters with 15 Air Circulating Fan (Power 100W Max) 3. Glass wire for hanging 10000 plants 4. Mulch Sheet (Double sided black & white sheet) for entire cabin area 5. 01 Lifter electric 1.5 tones 6. 05 Trolley (harvesting cart) 7. 20000 Clips for Plant Support 8. 04 each pH, EC, Soil Moisture, digital meters of EU standard with

	<p>following specifications:</p> <p>EC Meter Specifications:</p> <p>Conductive range 0.00 to 19.9 ms/cm Conductivity resolution 0.01ms/cm Accuracy ± 2% FS</p> <p>pH Meter Specifications:</p> <p>Range 0.00 to 14.00 pH Resolution - 0.01 pH Accuracy ±0.1</p> <p>pH Auto calibration</p> <p>9. Seed Storage Refrigerator It must have following specs:</p> <table border="1"> <thead> <tr> <th>Specification</th> <th>Recommended Range</th> </tr> </thead> <tbody> <tr> <td>Temperature</td> <td>0°C - 10°C (32°F - 50°F) Range</td> </tr> <tr> <td>Humidity Control</td> <td>25% - 40% RH</td> </tr> <tr> <td>Capacity</td> <td>100 - 500 liters (based on storage needs)</td> </tr> <tr> <td>Shelving System</td> <td>Adjustable stainless steel racks</td> </tr> <tr> <td>Cooling Type</td> <td>Compressor-based with digital control</td> </tr> <tr> <td>Defrost System</td> <td>Auto-defrost with condensation control</td> </tr> <tr> <td>Power Supply</td> <td>110V/220V, Energy-efficient (≤ 300W)</td> </tr> <tr> <td>Backup System</td> <td>Connected with installed Generator</td> </tr> <tr> <td>Door Type</td> <td>Double-sealed, insulated, glass/solid door</td> </tr> <tr> <td>Monitoring</td> <td>IoT-enabled temp & humidity sensors with System alerts</td> </tr> </tbody> </table>	Specification	Recommended Range	Temperature	0°C - 10°C (32°F - 50°F) Range	Humidity Control	25% - 40% RH	Capacity	100 - 500 liters (based on storage needs)	Shelving System	Adjustable stainless steel racks	Cooling Type	Compressor-based with digital control	Defrost System	Auto-defrost with condensation control	Power Supply	110V/220V, Energy-efficient (≤ 300W)	Backup System	Connected with installed Generator	Door Type	Double-sealed, insulated, glass/solid door	Monitoring	IoT-enabled temp & humidity sensors with System alerts
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Security/Safety system.	CCTV Cameras for internal Greencabin, control rooms and exit point with 30 days back up and display in control room with remote monitoring. Annex III for details																						
Generators	<p>Generator of sufficient power/ wattage to power greencabin and adjacent offices/ control rooms shall also be included in the technical & financial proposal.</p> <p>Automatic Top and both sides ventilation systems covered with insect net</p> <p>Main Accessories: plastic-film reeling motor, plastic-film shaft, plastic-film-fastening, profile, telescopic arms, etc</p>																						
Top/ Side ventilation system sufficient for system operations	<p>Cooling pad film rolling system.</p> <p>40 mesh insect net.</p> <p>Electric motor 100watt</p> <p>Voltage 220V, 50HZ</p>																						
Internet	Very high speed Internet connectivity is required for intelligent control																						

connection	system and transmission of data to other locations for observations /controlling reasons.
Accessories	Planting stands.(According to design) Crop hanging system. .(According to design) Growing media slab of coco peat.(According to requirement of design green cabin) Rock Wool Blocks (As per Nursery Growing Requirements)

SYSTEM REQUIREMENTS AND MAINTENANCE PLAN ALL EQUIPMENT AND SENSORS

Maintenance and Support

1. Regular system inspections and sensor calibrations (for one year), including monthly checks on sensors, controllers, valves, and pumps to ensure accurate operation.
2. Calibration of soil moisture, weather sensors, pH, EC sensors, and digital flow meters every three months or as required.
3. Quarterly preventive maintenance visits (One year) by trained technical personnel, with on-demand service visits available for unexpected issues
4. Regular software and firmware updates for the irrigation control system, fertigation software, and server-based monitoring application, including performance optimization patches.
5. 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).
6. Post-installation training must be conducted one month after installation, including two-day training on system maintenance, troubleshooting, and best practices.
7. One-year technical support, including 24/7 remote assistance for troubleshooting, issue resolution, and software/hardware concerns.
8. Guaranteed availability of spare parts for at least three years after installation.

Technical Requirements: Proposals must address the following specifications:

Detailed Drawings and Flow Diagrams

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

Technical Specifications of Each Component/System: Provide complete specifications, including:

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

Detailed Bill of Materials (BoM): A comprehensive list of all required components should be included in Financial proposal, including:

1. Itemized breakdown of each system component with technical specifications.
2. Quantity, unit price, and total cost estimates.
3. Manufacturer details, make, and model number of critical components.
4. Compliance with relevant quality standards (ISO, ASABE, etc.).

Miscellaneous Requirements

1. 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.
2. 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.
3. Proper labelling and tagging of each system and component with its specifications for better demonstration.

Appendix 'A'
To SRS

Furniture/Items Details for Control & Monitoring Room, Scientific Staff Offices, Scientific Staff Accommodation Rooms, Worker Accommodation Room are given below: -

Rooms/Offices	Furniture/Items Details	Qty.
Control Room & Monitoring Room	75" LED TV	04
	Video Wall Controller	01
	Workstation Tables With Revolving Chair	04
	Large Workstation Table to Accommodate at least 04 Persons	01
	Dual Monitor Arm	01
	Revolving Chairs for Large Workstation Table	04
	Water Dispenser	03
	Heavy Duty Imported Extension Leads/Boards	12
	Round Conference/Meeting Table for 12 Persons	01
	Conference/Meeting Chairs (Revolving)	12
Scientific Staff Offices	L-Shaped Workstation Desk with Drawers and Switches	02
	Revolving Office Chairs	02
	Storage Cabinet	02
	Center Table	02
	Side Table	04
	5 Seater Sofas for visitors	02
	43 Inch LED	02
02 Scientific Staff Accommodation Rooms	Double Bed	02
	High Quality Mattress	02
	Center Table	02
	Side Table	04
	05 Seater Sofa for visitors	02
	Workstation Tables With Revolving Chair	02
	Wall Mounted Wardrobe/Amirah	02
	43 Inch LED	02
Worker Accommodation Room	Single Bed with mattress	02
	Sofa Com Beds	02
	Wall Mounted Wardrobe	01
	Visitors Chairs	05
	43 Inch LED	01

Itemized Specifications for Surveillance Cameras

Item	Details/Specifications	Quantity
PTZ Cameras (pan-tilt-zoom)	Remote-controlled 360° rotation (pan), tilt, and optical zoom (up to 30x). Weatherproof (IP66/IP67) and vandal-resistant. Auto tracking to follow moving objects.	06 Locations will be finalized later
Fixed Cameras Bullet/Dome	Weatherproof (IP66/IP67) and vandal-resistant. High-Resolution Imaging & Low-Light Performance Smart Detection	07 Locations will be finalized later
Automated Alert & Announcement System (AAAS)	Emergency Alert System Supports real-time microphone input for instant announcements. Integrated alarm triggering for security and evacuation procedures.	01

Furniture/Items Details for Packaging Room

Rooms	Furniture/Items Details	Qty.
Packaging Room	2m x 1m Table for Sorting and Grading Stainless Steel Top	02
	2m x 1m Table for Washing of Vegetables attached with Water Sink sized 2' x 2'	01
	Water Taps mounted on Wall	03
	Moveable Trolley, Stainless Steel, having 3 Shelves, measuring LWH 4' x 4' x 6'	04

.PREPARATION OF PROPOSAL

1. Format of the Technical Offer is as follows:
 - (a) All Forms and applicable Annexures completed & signed with no information missing.
 - (b) **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.
 - (c) Design & Development Plans
 - (i) A full description of the proposed solution (category- wise) against requirements outlined in SRS-01 section (Appendix '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").
 - (ii) Include specifications and data for meeting all the technical requirements in SRS-1 (Appendix 'A').
 - (iii) 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**
 - (a) Supporting material may include diagrams, reference models (literature consulted, brochures, company agreements etc as per requirements of the Evaluation Criteria.
 - (b) All soft copies (that cannot be printed) shall be submitted on a USB drive as part of the technical proposal.
 - (c) 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**
 - (a) A description of the relevant experience of key team members dedicated for the project module is to be given in Form A-5.
 - (b) A description of the relevant technical resources in Form A-5 of the RFP.
 - (c) The purpose of this section is to show that the Bidder has enough expertise to complete the project.
 - (d) 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.

(e) **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:

- (a) Form A-1 Letter of Proposal dully filled and signed by authorized signatory
- (b) Form A-2 Bidder's General Data Information Form
- (c) Form A-3 Professional Profiles for Key Resources
- (d) Form A-4 List of Specific Projects already delivered.
- (e) Form A-5 Professional Profiles for Key Resources
- (f) Annexure D to Annexure F dully filled & signed by authorized signatory.
- (g) Bid Security in the form described in Bidding Process Instructions.
- (h) Letter of Authorization to sign the contract on behalf of the Bidder.
- (i) 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.

Stamp & Signatures

(In capacity of)

Duly authorized to sign bid for and on behalf of

WITNESS:

Signature

Address _____

BIDDER INFORMATION

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

Focal Person Details:

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

 (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]

Details of Tasks Assigned on this Project

6. 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
Technical Compliance	Adherence to technical specifications, system design, and requirements as outlined in the SRS, Appendix ‘A’ of this RFP.	Mandatory Compliance with each of the provided specifications.
Experience & Past Projects	Proven track record in designing and implementing smart irrigation systems and Greencabin. Must have completed at least 02 Projects of similar nature within past 03 years. Additionally, bidders will arrange Physical visit and demonstration of functional project.	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
Component Quality	Quality of proposed materials, equipment, and accessories.	Must meet international and accepted industry standards.
Automation & Integration	Level of automation, remote operation capability, and IoT integration.	Must comply with each of the requirement / specification. Compatibility with existing infrastructure.

Training & Support	Training plan, duration, and after-sales technical support	Min. 1-year support and on-site training to be proposed for atleast 1 month for atleast 15 people..
Warranty & Maintenance	Warranty duration and preventive maintenance plan	Min. 1-year warranty with service, maintenance and all related manuals as required.
Project Timeline	Realistic and efficient completion timeline	Completion of the entire project milestones as per the time schedule with minimum downtime for system deployment.
Sustainability Aspects	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.

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 with details of their accomplished functional projects. 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)**

Annexure “C-1”

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	Rate (PKR) /	Unit (number of	Total
Consultants (Part Time)					
Soil Expert				60	
Software				60	
Engr xxx				60	
xxx					
xxx					
Grand Total					

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, Supply, Installation and Operationalization Of Fully Functional Smart Green House (Cabin) & Smart Farm Along With All Necessary Services On Turnkey Basis” 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

Bidder

Dated:

Signed

Bidder

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: _____