



Empowering Communities with Sustainable Agricultural Systems;
piloting a small-scale hydroponics system (**EMSAS-Hydroponics**)

REQUEST FOR PROPOSAL (RFP)

for

**A&E Design and Construction/Setting-up of Screen House
and Hydroponics System**

for

EMSAS-Hydroponics

I. Background:

The technical assistance (TA) is titled Empowering Communities with Sustainable Agricultural Systems - Piloting a Small-Scale Hydroponics System (EMSAS) that is aimed at providing support to a sub-national agency in Nigeria and implemented at a community in Kubau Local Government Authority (LGA) to address climate change, insecurity and food security. It is implemented through the joint European Union - Climate Technology Centre and Network (EU-CTCN) programme - part of the EU Multi-Annual Indicative Programme for the Thematic Programme on Peace, Stability, and Conflict Prevention (2021-2027). The EU-CTCN programme aims to strengthen the resilience of conflict-affected societies by encouraging and facilitating conflict-sensitive, community-based technological solutions to climate change. The main objective is to pilot a small-scale hydroponics system in a community located in Kubau LGA. Through innovative technology and community engagement, the TA seeks to enhance agricultural resilience, reduce reliance on erratic weather patterns, and mitigate conflict-driven disruptions to traditional farming practices, ultimately contributing to sustainable development in conflict-affected regions.

Hence, the project will introduce sustainable hydroponics systems in the target community of Kubau Local Government Area. These systems will provide an innovative approach to agricultural production, utilising controlled environments and efficient water usage. A dedicated demonstration and training centre will be established to facilitate hands-on learning experiences for selected beneficiaries. This training centre would be a hub for knowledge exchange and skill development in hydroponics system operation and management.

By providing farmers with information on alternative farming techniques through the demonstration/piloting of hydroponics-based agriculture, the project aims to encourage the adoption of the hydroponics farming technique as an alternative to conventional farming methods. Hence reducing their vulnerability to conflicts and kidnappings. As farmers adopt alternative livelihood strategies, the project will contribute to mitigating the risk of conflicts and violence in the project areas. By offering sustainable income-generating opportunities, the project seeks to promote stability and resilience within the community.

Green Habitat Initiative (National Implementing Entity) is seeking to engage an Engineering Consultancy firm or expert (experienced in agriculture) for the Architectural & Engineering design and construction of a Screenhouse for the hydroponic system as a sustainable agricultural system in Kubau Local Government. The consultancy firm will provide technical insights and high-level guidance throughout the implementation of the hydroponic farm system.

This document defines the objective and scope of activities of the Engineering Consultancy Firm.

2. Objectives of the Engineering Expert/Consultancy Firm:

To lead the design and construction of small-scale hydroponic systems in Kaduna, aiming to empower local communities by providing sustainable agricultural solutions that enhance food security, improve nutritional outcomes, and foster economic growth. The Expert/Firm will be responsible for:

- I. Developing the Architectural and Engineering (A&E) design of a selected Screenhouse and hydroponic facility that meets the client's requirements and ensures optimal plant growth and productivity.
- II. Develop a comprehensive design plan, including layout, infrastructure, and systems, that integrates hydroponic technology with sustainable and energy-efficient practices.
- III. Set up of hydroponic system, including nutrient delivery, irrigation, and climate control, to ensure efficient and effective operation.
- IV. Coordinate the construction of the hydroponic facility, ensuring compliance with design specifications, quality standards, and relevant building codes and regulations.
- V. Ensure the hydroponic facility is designed and constructed to be: energy-efficient, water-efficient, sustainable, scalable and easy to maintain and operate.
- VI. Troubleshoot technical issues and conduct routine maintenance to maximise system efficiency.
- VII. Communicate effectively with stakeholders, clients, and partners to convey progress.

3. Responsibilities of the Engineering Expert/Consultancy firm:

- I. Detailed A&E Design of the Screenhouse and hydroponic systems that are suitable for various crops and local conditions.
- II. Develop a Bill of Engineering Measurement and Evaluation (BEME) for the designed Screenhouse and hydroponics system.
- III. Under the supervision of the hydroponics expert, construct the designed Screenhouse and hydroponics system.

4. Deliverables:

- I. **Deliverable A:** Architectural and Engineering (A & E) design of the selected Hydroponics system. An A&E design of a Screenhouse and the selected option of the hydroponic system will be developed. The A&E design should be detailed and also rendered in 3D. If possible, a VR design of the place should be made. The engineering design should also be fully detailed. Both designs must take cognizance of locally available materials and context, socially, physically, economically etc. The design will include components such as growing trays, irrigation systems, water pumps, automated control units, drainage systems, nutrient solution tanks, temperature and humidity sensors, and tray holding rails amongst all necessary hydroponics components. It should also consider locally available materials in the target communities to ensure the design can be replicated sustainably.

Upon completion of the architectural and engineering design, a one-day stakeholder workshop will be organised where you will demonstrate the design to stakeholders and community members. The workshop aims to facilitate contextual review and adoption of the design for implementation. Stakeholders will have the opportunity to provide feedback, ask questions, and ensure that the design meets their needs and expectations.

- II. **Deliverable B: BEME of the Selected Hydroponic Systems and Cost Analysis:**

This deliverable will provide detailed cost implications of constructing the Screenhouse and the selected hydroponics system, including the estimated expenses associated with its setup and operation. The analysis will cover costs for materials, equipment, labour, installation, and maintenance over the project lifecycle. It will also include a comparison of costs between the selected hydroponics system and alternative options considered. The cost analysis will inform budgeting and resource allocation decisions, ensuring efficient use of project funds and resources.

III. Deliverable C: Construction of the hydroponic facility: This deliverable will involve overseeing the site preparation, clearing and grading the land, excavation and foundation work (if necessary), installing utilities (water, electricity, etc.), building construction, erecting the facility's structure (walls, roof, etc.), installing doors, windows, and other exterior finishes.

The deliverable will also involve overseeing the installation of the hydroponic system's infrastructure (tanks, pipes, pumps, etc.), setting up the nutrient delivery and irrigation systems, and installing climate control systems (heating, cooling, ventilation, etc.). It will also involve installing electrical wiring and connections and the plumbing and water supply lines, installing grow beds, trellises, and other growing infrastructure. The setting up of LED lighting and other necessary equipment, installing nutrient tanks and mixing systems, setting up dosing and monitoring systems, installing irrigation pipes and drippers, setting up water treatment and filtration systems, installing temperature and humidity sensors, setting up automated climate control systems

Once the construction is completed, the expert is expected to supervise the testing of the hydroponic system's functionality and performance ensuring all components are working correctly prior to commissioning. This will be done in conjunction with our Hydroponic Expert.

5. Qualifications / Requirements (Individuals):

A. Individuals

- I. A Master's/Bachelor's degree in Agric, Civil or Environmental engineering, Architecture or a related discipline is a requirement to qualify for this position.
- II. A minimum of 3 years of relevant work experience in a hydroponics/climate-smart agricultural project of repute is a requirement.
- III. Proven experience in working with, designing, implementing, and managing hydroponic systems.
- IV. A strong understanding of plant physiology, nutrition, and growth requirements in hydroponic environments is desired.

- V. Ability to stay updated on the latest research and technological advancements in hydroponics while demonstrating a willingness to contribute to the development of new techniques or technologies in the field.
- VI. Experience with the use of project management software (e.g., Clickup, Slack, etc) is desirable.
- VII. Hausa Language skills are desirable.
- VIII. Previous design portfolios need to be provided.

B. Consultancy Firms

- I. A minimum of 5 years of demonstrable experience in the design and construction of a hydroponics system of farming with different crop varieties.
- II. Certificate of incorporation with the relevant authorities.
- III. Proven experience in offering consultancy services on hydroponics farming in Nigeria. Proofs should also include photos of works completed.
- IV. At least two reference letters from previous clients.

6. Required personal competencies:

- I. Excellent analytical and problem-solving skills.
- II. Sustainability Knowledge: Knowledge of the sustainability agenda and its relationship with business. Must possess a strong interest in driving corporate action on sustainable development. Must have an international and innovative outlook and mindset.
- III. Computer/Technical Skills: Advanced proficiency in MS Office Suite (Microsoft Word, Excel, and PowerPoint). Experience with the use of project management software (e.g., Clickup, Slack, etc) is desirable.
- IV. Client Orientation: Considers all those to whom services are provided to be “clients” and seeks to see things from clients’ point of view. Establishes and maintains productive relationships with key decision makers by gaining their trust and respect; Identifies clients’ needs and matches them to appropriate solutions; responds to questions, concerns, and requests from executives; meets timeline for delivery of services to a client.
- V. Research and Analytical Skills: Exceptional ability to conduct research effectively and assemble this information in a timely manner. Proven critical thinker with strong analytical skills. Ability to explain complex information in a clear, concise, and practical manner. Exceptional attention to detail that demonstrates an ability

to evaluate complex information or problems to find a precise and digestible solution.

- VI. **Communication and Language Skills:** Advanced communication skills, including outstanding written and spoken English skills that enable him/her to communicate professionally and confidently. Ability to interact with a broad set of businesses and present over the phone, virtually, and in person. Listens to others, correctly interprets messages from others, and responds appropriately. Ability to communicate persuasively in written form to help engage at scale. Asks questions to clarify and exhibits interest in having two-way communication. Exceptional attention to detail, including tailoring language, tone, and content to match various audiences. Demonstrates openness in sharing information and keeping people informed.
- VII. Ability to engage and manage strategic stakeholders, including government, implementing partners, academia, and the private sector.
- VIII. Attention to detail and Knowledge of the Hausa Language is desirable.

7. Type of engagement and duration

The Engineering expert or consultancy firm will be engaged on a contract basis and he/she is expected to deliver the deliverables as outlined below promptly and timely with the highest level of proficiency and expertise.

Table I.0: Required Number of Days for Deliverables

SN	Deliverables	Time-frame for the deliverable
1	Deliverable A: an architectural and engineering (A & E) design of the Greenhouse and selected option from the selected hydroponic system will be developed. The architectural design should be detailed and also rendered in 3D. If possible, a VR design of the system should be made.	Ten (10) days
2	Deliverable B: Cost Analysis of the Selected Hydroponic Systems: This deliverable will provide detailed cost estimates and analysis of the selected hydroponics system, including the estimated expenses associated with its setup and operation. For this deliverable, a Bill of Engineering Measurement and Evaluation (BEME) is expected.	Seven (7) days
3	Deliverable C: Construction of the hydroponic facility: This deliverable will involve supervising the site preparation, the installation of the hydroponic system's infrastructure (tanks, pipes, pumps, etc.), setting up the nutrient delivery and irrigation systems, Installing climate control systems (heating, cooling, ventilation, etc.).	Fourteen (14) days
Total number of days		Thirty-one (31) days

8. Benefits

- I. The expert will be entitled to a competitive contract sum attached to milestones.
- II. Flexible working conditions with no office hours.

9. Duration

The deliverables outlined are to be delivered in 31 days, starting from 2nd September 2024. However, the engagement for this role will be for the agreed period spread across the project timeline (from August 2024 to April 2025). The expert or consultancy firm is expected to remain available during the contract duration and deliver all outlined deliverables promptly.

I0. Submission Requirements for this RFP

You are expected to submit a proposal of how you will conduct the activity. The proposal must have these contents while adhering to the page limit (12-font size, 1.5 line spacing, 1” margin, not more than 275 words per page):

- I. Introduction/Background/proposal summary (1 page)
- II. Methodology (technical approach, data collection tools and methods, data analysis, innovation, etc) (4 pages)
- III. Workplan with timelines (3 pages). The second page is the Gantt chart.
- IV. Proposed remuneration/compensation per deliverable in NGN. A more detailed breakdown of cost items under each deliverable is required.
- V. Referee contacts (must be a previous client who was involved in your hydroponics design work)
- VI. CVs. For consultancy firms: Attach CVs (Max. of two pages for each expert) of leading experts. For individuals, 2 pages maximum for the expert.
- VII. The deadline for submitting your proposal is 28th August 2024 at 11.59 pm West African Time.
- VIII. Send your proposal to this email address: mustapha.dewu@greenhabitat.ng with a copy to habibadamu99@gmail.com

I I. Main Contact Point

The main contact point of the TA shall be GHI, through:

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