



ARTIFICIAL INTELLIGENCE FOR DEVELOPMENT AFRICA



ARTIFICIAL INTELLIGENCE FOR AGRICULTURE AND FOOD SYSTEMS (AI4AFS) INNOVATION RESEARCH NETWORK

CALL FOR PROPOSAL (CFP)

On

Advancing Responsible Gender Equality and Inclusive Artificial Intelligence Innovations for Agriculture and Food Systems in Africa (AI4AFS +)

Date of issue: **11 December, 2024**

Deadline for Submission of Proposal: **31 January, 2025, Time: 23:59 EAT***

A. Background

Artificial intelligence (AI) presents a powerful technological opportunity to catalyze sustainable transformation across Africa's vital agriculture and food systems. AI applications spanning computer vision, machine learning, robotics and more can enhance productivity, efficiency and resilience for smallholder farmers, agribusinesses, supply chains and consumers. However, persistent lack of accountability, transparency and potential for bias or negative unintended consequences pose serious risks if AI innovation is not responsible and pursued through inclusive, ethical and context-appropriate processes.

The first phase of this pioneering Pan-African program took important strides by providing funding along with technical assistance and capacity building to 10 sub-grantees piloting AI research and innovation development across the agricultural value chain. The 10 research and innovation themes and countries of implementation include:

1. Project 1: Monitoring and Artificial Intelligence Tools for Smart Agriculture - Cape Verde

2. Project 2: Development of Machine Learning Model for Crop Pests and Diseases Diagnosis Based on Crop Imagery Data - Tanzania
3. Project 3: Enhancing Farm-scale Crop Yield Prediction using Machine Learning for Internet of Agro – Things in Tanzania - Tanzania
4. Project 4: Using Artificial Intelligence to enhance the Production, Management and Marketing of Nsukka Yellow Pepper (*Capsicum Chinense* Nsukkadrilus) - Nigeria
5. Project 5: Scaling Smartphone-Based Tools for Early Crop Diseases Detection & Monitoring - Uganda
6. Project 6: Pest Occurrence Early Warning System and Diagnostic Tool Development using Geoinformation and Artificial Intelligence: A Case Study of Tomato Leaf Miner (*Tuta Absoluta*), and Whiteflies in Machakos County, Kenya) - Kenya
7. Project 7: Empowering Smallholder Farmers (SHF) in Busia County using Low-Cost IoT (Internet of Things) and AI (Artificial Intelligence) Tools - Kenya
8. Project 8: Building the artificial intelligence (AI) for soil moisture and nutrient monitoring under irrigated agriculture among smallholder farmers, academic and agriculture experts in Malawi - Malawi
9. Project 9: TOLBI AI, an AI-based digital tool for smart, sustainable, and efficient agriculture - Senegal
10. Project 10: Detection of Crop Pests and Diseases on Web and Mobile Devices using Deep Learning - Ghana

This initial cohort made significant strides in developing and deploying AI tools and innovations in agriculture and food systems but also encountered some challenges in operationalizing responsible, gender equitable and socially inclusive home-grown AI innovations at scale. Critical lessons included the importance of interdisciplinary teams encompassing technical AI capabilities along with gender experts, ethicists, and social scientists. Other key issues were the lack of rigorous processes to de-bias data and models, limited governance models that are co-created with stakeholders, and inadequate benefit-sharing mechanisms for communities.

While valuable insights were generated, gaps remain in operationalizing scalable, robust, and responsible, gender equality, and inclusive AI innovation models for agriculture/food systems in practice. Challenges span from technical dimensions like securing and optimizing AI systems, robust to social factors such as participatory solution development and gender, equality, diversity, and inclusion (GEDI), equitable business models and trusted governance frameworks co-created with communities and local stakeholders. Another key gap was the robust monitoring, evaluation, and learning (MEL) of grantees' project implementation at each stage to ensure responsible and GEDI AI development, deployment, and scale. Based on the identified challenges, there is need to extend support to further advance potentially scalable innovations from the first phase along the responsible AI and gender and inclusion developments, deployment, and scaling, while identifying new innovations that close the gaps in other components of food security such as food utilization and food access.

B. Goals and Objective of the AI4AFS+

The AI4AFS+ initiative aims to responsibly scale up high-impact developed AI4AFS innovations to enhance sustainable transformation of AFS across Africa. This new phase also aims to support and catalyse a group of promising AI innovations in other food security components that align and promote responsible AI principles. The specific objectives of the AI4AFS+ are:

1. **Assess the effectiveness of the developed AI tools in AFS positioned to scale:** The assessment in this objective is two-fold namely the effectiveness in the research process and effectiveness of innovation to users. This objective aims to foster integration of responsible AI practices by innovators including gender equality and social inclusion, ethical correctness and environmental safety. On the other hand, effective AI tools are those that meet priority need of users, AI tools that are easy to use, accessible, have envisaged social-economic impact and are scalable;
2. **Scale existing high-impact AI4AFS innovations that integrate gender, equality, diversity, and inclusion:** This objective aims to deepen the integration of responsible AI practices, gender equality, diversity, and social inclusiveness within selected high-impact innovations from the existing AI4AFS innovation research network by assessing the effectiveness and ethical implications of existing AI tools in tackling defined challenges in Agriculture and Food systems;
3. **Support new AI4AFS innovations:** This aims to extend support systems to new high-impact AI innovations that address other aspects of food security, such as food access and food utilisation that were not captured or covered during the first phase of the AI4AFS programme implementation.
4. **Establish an AI4AFS community of practice (COP):** This objective seeks to establish gender and inclusive AI4AFS Community of Practice (COP). This community will serve as a dynamic platform for consolidating learnings, sharing knowledge continuously, and co-creating open-source resources, tools, practices, and policies.

C. About the Call

The [African Technology Policy Studies Network](#) (ATPS) is partnering with the [International Centre of Insect Physiology and Ecology](#) (*icipe*) and [Kumasi Hive](#), are pleased to announce a call for proposals under the **Advancing Responsible Gender Equality and Inclusive Artificial Intelligence Innovations for Agriculture and Food Systems in Africa (AI4AFS +)** aimed at scaling AI innovations that enhance utilization and access to food, as part of broader food security initiatives. This funding opportunity seeks to support projects that responsibly scale AI systems, ensuring they contribute to sustainable development goals, particularly focusing on gender equality, diversity, and inclusion (GEDI). The primary objective of this subgrant is to support innovative projects that leverage AI to improve food security by enhancing the utilization and access to food. Proposals should demonstrate a clear plan for scaling AI solutions that are responsible, equitable, and inclusive.

D. Scope of the Call

Applicants are invited to submit proposals that address one or more of the following areas of food security acknowledged by United Nations:

- i) **Access to Food through AI Innovations**: Proponents should showcase how their AI innovations can be utilized to improve access to food, including through predictive analytics, smart logistics, or supply chain optimization. Emphasis should be placed on scaling these solutions in a manner that ensures equitable access, especially for marginalized groups. Priority will be given to: ***Food demand monitoring*** (tools for real-time monitoring and control of changes in food demand); ***Supply chain management*** (tools for monitoring food origin, quality, and safety that affords transparency, trust, certification, and traceability of food product supply chain from farm to fork); ***Food retailing*** (tools for predicting consumer demands, perceptions, and buying behaviour); and ***Transportation and storage*** (preservation of food product quality, to ensure safe food products and to minimize the product damage); ***Inventory management*** (prediction of daily food demand and to ensure that there are no inventory-related problems).
- ii) **Utilization of AI in Food Security**: Proponents should show how their AI innovations and technologies can be applied to optimize food distribution, reduce waste, improve food quality, or enhance nutrition. Projects should focus on scaling these AI solutions to reach broader populations, with a particular emphasis on underserved communities. The thematic areas include: ***Modern processing techniques*** (software algorithms for enhancing heating, cooling, milling, smoking, cooking and drying to ensure high quality and quantity of agrifood products and, at the same time, avoiding overutilization of resources and wastages); ***Minimizing postharvest losses*** (tools for preservation, processing, safe storage of foods); ***Societal impacts*** (ecology, infrastructure, livelihoods, nutrition, social systems, crisis and cultural practices of the food systems);

Eligible projects will not be project at conception or idea stage but research for impact projects that are in testing of experimental-stage pilots and/or prototypes and ***scalable***, as applicable. The funded projects are required to apply ***Responsible Artificial Intelligence*** (Machine Learning, Data Science, etc.), be multidisciplinary, adhere to the highest standards of research excellence, and strive to have direct and lasting benefits to communities in their home countries.

E. Eligibility

i. Team Composition

A consortium of multidisciplinary teams that are gender-sensitive, inclusive, and equitable in the development, deployment and scaling of responsible AI for agriculture and food systems. The teams must be made of the following entities:

- Research institutions (public research institutions/government organizations/universities) comprising scientists, policymakers, engineers, agriculturists, etc.
- Private sector entities including Micro, Small and Medium-scale Enterprises (MSMEs), Entrepreneurs, Innovation hubs/parks, etc.
- Civil Society actors including Think Tanks, Rights-based Organizations, NGOs, Consumer Organizations, etc.

ii. Eligible Countries

Applicants must come from any of the sub-Saharan African (SSA) countries. However, applicants can team up (form consortia) with other organizations outside the SSA countries. The lead applicants **MUST** be from SSA.

F. Grant Duration and Amount

The project's lifespan is **16 months**. Each project will be required to have a budget ranging between **US\$25,000** and **US\$30,000** depending on the scope and scale of the proposed project which must be well justified.

G. The application process

Applicants are required to develop a Proposal providing details of their research or innovation projects. The project should demonstrate how it is aligned with the priority areas described in **Part B** above. The Proposal should contain the following sections:

Section 1. Contact information

Please provide the contact information of the lead applicant and the other partner organizations.

Section 2 Project Title (max. 250 characters).

Enter a short plain language title of the proposed project

Section 3. Abstract (400 words)

Please provide a short abstract of the proposed project, which should not exceed 400 words. It should be written clearly for a non-technical audience. Avoid acronyms and technical jargon. Describe the development of the problem being addressed, the purpose/objectives of the project, and expected results in the form of project outputs and outcomes.

Section 4. Research problem(s) and justification (max. 1,500 words)

This section describes the potential range of problem(s) and or problem area(s) that could be investigated and the questions that will guide the innovation research conducted by the applicant. To show the importance of the problems, this section should discuss: how the research relates to tackling pressing challenges in agriculture and food systems in its area of coverage, the magnitude of the problems and how the research will contribute to its solution. It should show how it addresses **gender equality, diversity, and inclusion** issues in Agriculture and Artificial Intelligence; provide a justification for the selected innovative approach(es) to be adapted and further tested.

Section 5. Objectives (max. 1000 words)

This section should provide both the research's general and specific objectives that are aligned to 1 or more of the four (4) dimensions of food security (availability, Access, Utilization and Stability). The general objective should state the development goals being pursued by the research. The specific objectives should indicate the specific types of knowledge to be produced, the audiences to be reached, and forms of capacity to be reinforced. These are the objectives against which the project's success will be judged.

Section 5. Methodology (max. 2000 words)

The proposed project research methods should aim to contain the following:

- i. Describe the proposed method in developing and deploying responsible artificial intelligence in agriculture and food systems, with clear identification of any of the two (2) component areas of food security that the project addresses as mentioned in **Part B**. The methods should align with *standards theories and protocols of Responsible AI and Gender Equality, Diversity, and Inclusion* in the development and deployment of AI projects
- ii. Description of the team's proposed activities, outputs, outcomes, and foreseen impacts on transforming agriculture and food systems in Africa.
- iii. A clear description of how the teams will be involved in fair and equitable partnerships during the project. This will mean that the project identifies and links each partner to the research activity.
- iv. Identify the perceived risks to achieving project objectives and strategies for mitigation.
- v. Describe the **technology readiness level** of the project, mentioning if it is conception stage, ideation, pilot, or market fit. Note that each project submitted will be demonstrated.
- vi. Describe how the project can be upscaled, replicated, and commercialized.

Section 6. Project schedule

The project management Gantt chart should include key activities, deliverables/outputs, indicators, and outcomes that can be related to the items included in the project budget. Use the [AI4AFS+ Gantt Chart](#). A clear theory of change should be included in this section and be uploaded showing the *challenge, activities, outputs, short-term outcomes, intermediate outcomes, and foreseeable impact*.

Section 7: Project budget

Please provide Personnel, Consultants, Evaluation, Equipment, Local travel, Training, Research, and Indirect costs relevant to your proposed project with a brief description of each cost as found in the [budget template](#). Give an explanation of how funds will be used to support *Gender Equality Diversity and Inclusion* initiatives.

Section 8. Institutions and personnel (500 words)

The applicant should describe the institutions/SMEs/organizations, including its history and objectives. List key personnel, their qualifications, roles, and time commitments. State who will own the equipment during and after the project. Describe any administrative arrangements that may include third parties.

Section 9. Responsible Artificial Intelligence considerations¹.

Applications should respond to how the project will address the key principles of responsible Artificial Intelligence found in the *Responsible AI Assessment template*. Please note that when

¹ **Responsible Artificial Intelligence** is the practice of designing, developing, and deploying AI with good intention to empower people and fairly impact society. It also ensures there is transparency, accountability, no bias, fairness, security, privacy and has minimal ecological footprint.

developing web pages or tools, the accessibility of such sites/tools must be checked to meet the accessibility requirement for this program that considers people with disability². Also teams are expected to consult the [Technical brief](#) on *Technical Brief: AI Life Cycles: The Essential Questions* and the ATPS Newsletter Issue No. 24 September 2024 on [Scaling Responsible AI: A Framework for Agriculture and Food Systems in Africa](#).

Section 10. Gender equality, Diversity, and inclusion considerations (max. 500 words)

Discuss how the project addresses topics of gender equality, diversity, and inclusion and how it is integrated in the project design, methods, analysis, outputs, outcomes, and potential impacts. Discuss the level of the continuum of gender integration throughout the project. The [IDRC's Equality Statement](#); the [Actions Promoting the Equality and Status of Women in Research provided by the Global Research Council](#); and [Top Ten Gender Equality and Inclusion Priorities for AI4D](#), will serve as a reference guide and applicants should ensure that their projects adhere to these guidelines. Identify where your project sits on the gender equality and inclusion (GEI) continuum (refer to the [Top Ten Gender Equality and Inclusion Priorities for AI4D](#)).

Section 11. Carbon Footprint Reporting (max. 500 words): The project proposal should demonstrate how it will track carbon footprint in all its activities. All projects for this call must use <https://mlco2.github.io/impact/> and <https://codecarbon.io/index.html> for tracking and reporting carbon emission related activities.

Section 12. Knowledge-mobilization strategy (max. 400 words)

Explain how the activities and outputs of the project will engage, on an ongoing basis, potential knowledge users, including ministries of education; the strategies to ensure that research results are used by relevant stakeholders; and the outcomes of the project might be for policy-making.

Section 13. Supporting documents: The following supporting documents must be included:

- Full CV of key project members;
- Letters of affiliation to an institution;
- Support letters from the participating partners/organizations;
- Certificate of incorporation or registration for the Lead Institution.

H. Review of applications and selection criteria

The assessment criteria will focus on six main areas namely:

- Qualifications and team composition** (10%): The team must be multidisciplinary, gender-sensitive, inclusive, and equitable. The team must comprise the research institution (government or private), private sector, and civil society organization teams, including but not limited to government, private sector, academia, farmers, and agribusiness entrepreneurs, which are highly encouraged and will be an added advantage. Support from government parastatal overseeing relevant sectors is an added advantage.
- Experience in the relevant area of research and innovation** (10%): The team must prove that they have relevant experience in the chosen field of endeavour demonstrated by

² Check and install the plugin WAVE Web Accessibility Evaluation Tool @ wave.webaim.org

previous project references and track record from supporting CVs. ***There must be evidence that the solution is already working in context of use.***

- iii) **Technical capabilities** (25%): The Proposal must align with the overall objective of the AI4AFS and the identified thematic priority areas. It must have clarity on the aim and objectives, research/innovation designs and methods, activities, outputs, outcomes, impact, and sustainability.
- iv) **Knowledge-mobilization strategy** (10%): The proposal must show how activities and outputs of the project will engage, on an ongoing basis, potential knowledge users, including ministries of agriculture; the strategies to ensure that research results are used by relevant stakeholders in Africa.
- v) **Responsible AI principles embedded in the research project:** (10%): The proposal demonstrates a clear pathway for integrating all RAI principles in all AI development and deployment activities. It also contains a clear pathway for carbon footprint reporting in all activities.
- vi) **Gender Equality, Diversity and Inclusion** (10%): The project shows a clear path to gender support and inclusion in the project activities, including machine learning algorithms, training, engagements, and workshops.
- vii) **Carbon Footprint Reporting** (10%): The proposed project demonstrates how the carbon footprint of all activities, especially machine learning processes, will be tracked. A clear statement of how the project will adapt to the green activities pathway is an added advantage.
- viii) **Governance structure** (5%): The team must demonstrate how it will be governed and managed to accomplish the stated objectives.
- ix) **Budgeting** (10%): Demonstrated clear and coherent plans for the use of available funds for the proposed project activities.

NB: Only 1-2 projects will be awarded after final reviews and due diligence. Shortlisted projects will be physically evaluated and must demonstrate tangible evidence that there is a working solution. Selected project will receive mentor form the AI4D-Africa Track mentorship program for scale responsible artificial intelligence

I. Timeline for this call

Activity	Date
Launch of Full Proposal	11 December 2024
Proposal Call Information Webinar	13 January 2025
Deadline of Full Proposal submission	31 January 2025, Time: 23:59 EAT*
Review of the applications	10 February 2025, Time: 23:59 EAT*
Responses to applicants	27 February , 2025,
Contract Signing and Awards	15 March, 2025,

*East African Time or GMT+3

J. How to Apply

All proposals **MUST** be submitted via [submission form](#) on ATPS data base.

The proposal should be submitted in **English**.

Submit your questions for clarification before the Webinar on 13th January, 2025 to the email: ai4afs@atpsnet.org with a copy to the executivedirector@atpsnet.org.

For more information about this application process, always visit the ATPS website - <https://atpsnet.org/> OR the dedicated project website - <https://atpsice.org/artificial-intelligence-agriculture-and-food-systems/> to receive updated news and information for guidance. You are also required to complete online, **the Gender Support and Inclusion and the Carbon Footprint Checklists** attached to this call.

K. Gender Support and Inclusion Checklist

Key questions for Gender Support and Inclusion	YES	NO
1. Is there 1/3 representation of women in the composition of your consortium?	<input type="checkbox"/>	<input type="checkbox"/>
2. Does the Proposal give equal opportunity to women and youth?	<input type="checkbox"/>	<input type="checkbox"/>
3. Are there logos, symbols, or terms that show gender bias in the Proposal?	<input type="checkbox"/>	<input type="checkbox"/>
4. Has the Proposal specifically been shared with women professionals and women's networks?	<input type="checkbox"/>	<input type="checkbox"/>
5. Have women's contributions and suggestions been taken seriously and acted upon in the Proposal?	<input type="checkbox"/>	<input type="checkbox"/>
6. Have women been given key roles in your proposed project?	<input type="checkbox"/>	<input type="checkbox"/>
7. Will women and men be afforded equal opportunity to speak and voice their opinions?	<input type="checkbox"/>	<input type="checkbox"/>
8. In the preparation of the Proposal, did the team converse with women and men of different professional, social, cultural and religious groups?	<input type="checkbox"/>	<input type="checkbox"/>
9. Have persons living with disabilities been considered for the team?	<input type="checkbox"/>	<input type="checkbox"/>
10. Has the proposed project been designed with the needs, priorities and concerns of women and men of different social, cultural and religious groups, in mind?	<input type="checkbox"/>	<input type="checkbox"/>
11. Will the proposed project cause harm to any group(s) in any way?	<input type="checkbox"/>	<input type="checkbox"/>
12. Do my interventions enable equal access and participation of women and men, of different social, cultural and religious groups?	<input type="checkbox"/>	<input type="checkbox"/>
13. Have I considered different outreach mechanisms to increase the participation of marginalized groups?	<input type="checkbox"/>	<input type="checkbox"/>
14. Will the proposed project impact positively on both women and men?	<input type="checkbox"/>	<input type="checkbox"/>
15. Will the project outcomes impact men and women differently?	<input type="checkbox"/>	<input type="checkbox"/>
16. Will sex-disaggregated data be collected and reported in your proposed project?	<input type="checkbox"/>	<input type="checkbox"/>

L. Carbon Footprint Checklist

Key questions under Carbon Footprint Reporting	YES	NO
1. Will the proposed project support the development and deployment of green solutions, products, and services?	<input type="checkbox"/>	<input type="checkbox"/>
2. Will the proposed project encourage the uptake of green literacy and practices?	<input type="checkbox"/>	<input type="checkbox"/>
3. Will the proposed project activities support virtual or remote communications to decrease the carbon impact of travelling?	<input type="checkbox"/>	<input type="checkbox"/>
4. Will the materials, accessories, and consumables that will be used in the project comply with environmentally safe practices?	<input type="checkbox"/>	<input type="checkbox"/>

5. Will all waste generated be recycled or safely disposed?	<input type="checkbox"/>	<input type="checkbox"/>
6. Will the entire project lifecycle ensure the use of energy-saving settings for computers, printers, and other equipment?	<input type="checkbox"/>	<input type="checkbox"/>
7. Will the project activity ensure that document printing is avoided as much as possible?	<input type="checkbox"/>	<input type="checkbox"/>
8. Will the proposed project ensure best practice in carbon footprint reporting, ensuring all details in its lifecycle are accounted for?	<input type="checkbox"/>	<input type="checkbox"/>
9. Will the proposed project ensure the use of renewable energy?	<input type="checkbox"/>	<input type="checkbox"/>