Managing Organization (Hub) for Responsible Artificial Intelligence for Agriculture and Food Systems (AI4AFS) Innovation Research Network in Africa

AFRICAI CONFERENCE 2023 PARTICIPATION AND MID-TERM REVIEW AND EVALUATION REPORT

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Radisson Blu, Kigali, Rwanda

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Executive Summary

This mid-term evaluation report assesses the progress and performance of the Managing Organization (Hub) for Responsible Artificial Intelligence for Agriculture and Food Systems (AI4AFS) Innovation Research Network in Africa project during the reporting period from October 2021 to September 2023. The project has made significant strides in achieving its objectives, with key milestones reached and positive impacts observed among target beneficiaries. Grantee selection was conducted transparently and in compliance with established criteria. Grantees have shown commendable performance, although some capacity-building needs have been identified and training taking place to build the capacity of the grantees. Financial management has been efficient, with no major discrepancies except for the re-allocation of funds from the costs of translation to the Electronic Grant management system Subscription Renewal.

Introduction

The Managing Organization (Hub) for Responsible Artificial Intelligence for Agriculture and Food Systems (AI4AFS) Innovation Research Network in Africa project was initiated to **advance the responsible development, deployment and scaling of home-grown AI innovations to tackle pressing challenges in agriculture and food systems in Africa**. Achieving this objective would make a significant contribution to agriculture, food and nutritional security as well as enhance the livelihoods of African people especially women and youth who form most of the small-scale farmers in Africa. By developing, deploying and scaling AI innovations that are homegrown, peculiar agricultural production and productivity challenges unique to Africa can be addressed. The mid-term evaluation aims to provide insights into the project's progress, grantee performance, and its impact on target beneficiaries.

Methodology

The evaluation employed a mixed-methods approach, combining document review, grantees presentation (physical), virtual meetings, and on-site visits. Data was collected from project records, grantee reports, and direct interactions with stakeholders. While every effort was made to ensure accuracy, limitations include the inability to physically visit all grantees to have a first-hand observation of projects.

Project Progress

During the reporting period, the project successfully implemented all key activities which include; project launch, establishment of the Hub Management Committee (HMC) and other key personnel, development and issuance of call for Expression of Interest (EoI), selection of quality Concept Notes, training of shortlisted applicants on key aspects of AI and AFS and on full proposal development, development and issuance of Call for full Proposals (CfPs), identification of external expert reviewers and evaluation of proposals, selection of the research network grantees, the signing of sub-grant agreements and inception meeting, conduct capacity needs assessment of network grantees, training of network grantees, mid-term review meeting and cross-learning opportunity, continuous monitoring, evaluation and learning, data archiving and storage, financial audit, documentation of proven AI research and innovations that have been developed, deployed and up-scaled for AFS under the research network, and research synthesis and knowledge mobilization Notable achievements include **selection of network grantees that is equitably distributed and gender balance, training of the grantees in identified areas of need, organization of conference session for knowledge dissemination and participation in the 1ˢᵗ Africa AI conference in Kigali, Rwanda where the network influenced international and African policy**

discussion providing strong evidence for reforms and use of AI to improve Agriculture and food systems. Challenges encountered included the selection of experts for the evaluation of proposals, identification of female AI experts, and tokenism in engaging women researchers in the AI field.

Grantee Selection Process

The grantee selection process adhered to the rigorous criteria outlined in the grant guidelines. It was conducted transparently, with careful consideration of applicants' qualifications and project proposals. Ten grantees from eight countries in sub-Saharan Africa with equal representation of both gender were selected and award grants amounting to between 40,000 USD to 60,000 USD.

Grantee Performance

Individual grantees have demonstrated satisfactory performance in meeting project goals. The AfricaAI conference 2023 offered an opportunity to individually assess for each grantee is doing as it relates to their specific project objective and the AI4AFS overall project goal. On the 13th of June, 2023 during the parallel session on ***Advancing Responsible and Open AI in Agriculture and Food Systems in Africa,*** held at the Intel Room (AD4), Radisson Blu Hotel and Convention Centre, Kigali, Rwanda, each grantee made a 10 minutes presentation of their projects. The presentation involved stating the clear objectives of the projects, activities that have been undertaken, pathways to gender equality and inclusion, communication and coordination among project partners, and key outputs and outcomes. These presentations were compared with their stated activities and principles guiding the AI4AFS Network by a panel of experts drawn for the AI4AFS partners and an international gender inclusion expert, Dr. Shannon. Compliance with grant terms and conditions has been observed. Some images from the meeting are presented below as Figure 1-5.

Evaluation of Grantees

The results of each grantee's project evaluation are in the link: Grantees Project Mid-Term Evaluation. The overall average score of 7 out of 10 from the experts shows that the grantees are successfully implementing their project. The overall grantees' project review presentations are in the link Presentation at the AfricaAI conference 2023. Some project outputs have been recorded by the grantees; some include the development of mobile applications for Cashew and Maize disease detection in Ghana, the development of a mobile application for early disease diagnosis in Uganda, and the development of an AI-based Raspberry PI Nsukka yellow pepper disease detection in Nigeria. Other outputs such as publication and media engagement have been reported in the 4th technical progress report.

Overall performance of the grantees

The network grantees' overall performance as a team was assessed collectively to understand if as a group their projects are aligning with the overall objectives of the AI4AFS project. The analysis below presents the team performance against selected questions which aligns with the core goal of the AI4AFS project. Mid-Term Project Evaluation Form: Artificial Intelligence Applications in Agriculture and Food Systems. The scores will be used to determine further support to the Grantees. The instruction to the experts was to provide honest and thoughtful feedback by rating each criterion on a scale of 1 to 5, where 1 represents "Poor" and 5 represents "Excellent." Additionally, provide comments or suggestions where necessary. (1=Poor, 2= Fair, 3= Good, 4= Very Good, and 5= Excellent)

A. The ability of the project team to meet AI4AFS project objectives.

Figure A below shows that the experts believed that the grantees met the project objectives in a very good way with a score of 73.9% and in an excellent manner with a score of 21.7%.
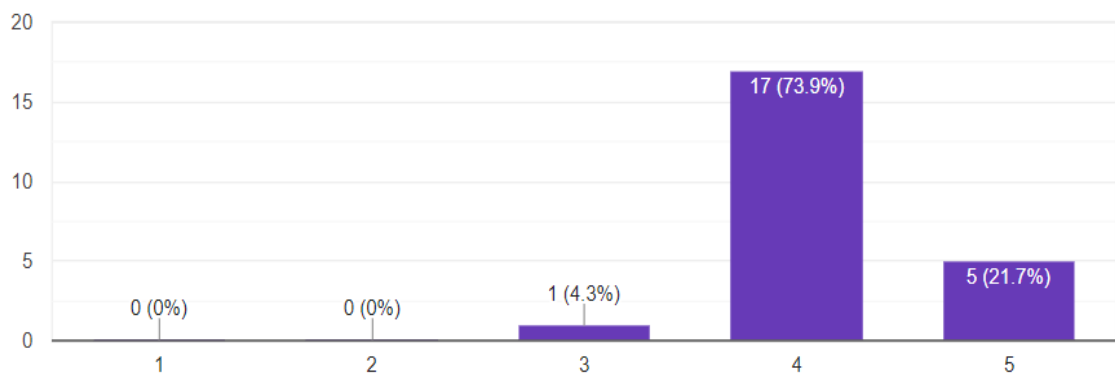

Figure A: Assessment of grantees ability to meet project objectives.

B. Assessment of grantees' project's adherence to responsible AI principles? (Transparency, Fairness and Non-Discrimination, Safety and Reliability)

Figure B below shows that the experts believed that the grantees adhered to RAI principles to a large extent scoring the projects 69.6% of the projects very good and 13% as excellent. This shows that the projects are utilizing the various capacity-building initiatives of the network to a great advantage.
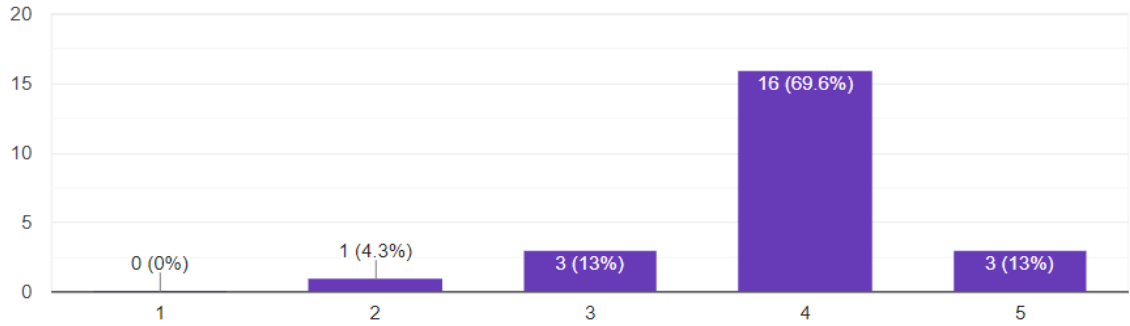
Figure B: Assessment of grantees adherence to RAI principles.

C. Assessment of grantees projects' potential for scale-up

Figure C below shows that the experts believed that the 47.8% and 26.1% of the projects have very good and excellent potential for scale-up, while 21.7% have good potential for scale-up. Overall the grantees project has potential for scale-up.
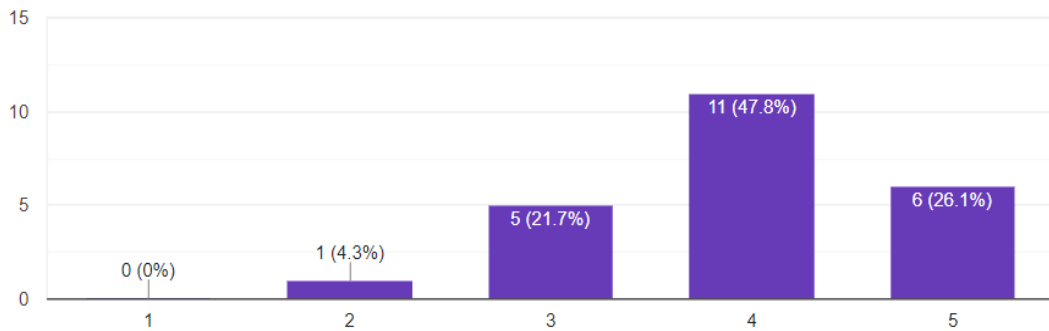

Figure C: Assessment of grantees projects' potential for scale-up.

D. Assessment of projects' integration of **Gender Equality and Social Inclusion (GESI)** Artificial Intelligence Development and Deployment.

Figure D below shows that the experts believed that 43.5% and 39.1% of the projects had very good and excellent integration of GESI principles in the implementation of their projects, while 4.3% each had fair and poor integration of GESI principles. The result illustrates the depth of support received from the AI4D on GESI considerations in the AI4AFS project implementation.
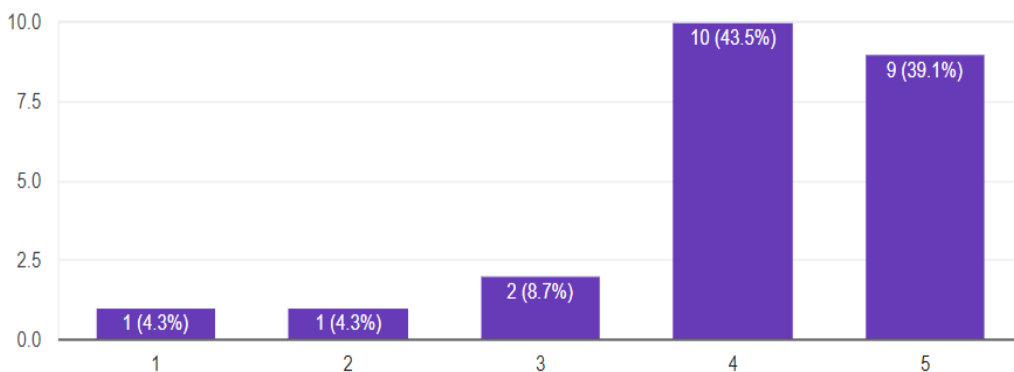

Figure D: Assessment of grantees projects' integration of GESI principles.

E. The extent of evidence being generated from the projects will inform policy and practice in the agriculture and food systems.

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Figure E below shows that the experts agreed that 78.3% and 8.7% of the projects have very good and excellent opportunities to influence policy and practice from the evidence generated. This shows that the network is on course to deliver on its objectives.
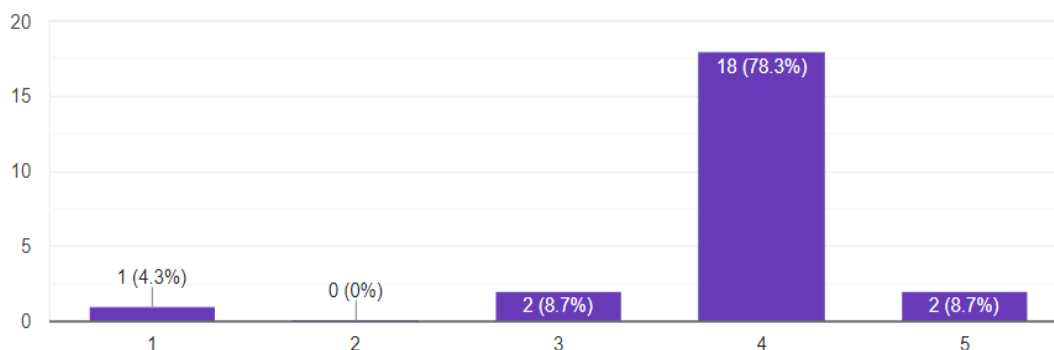

Figure E: Assessment of the extent the evidence generated will inform policy and practice in AFS.

F. Overall comment of the evaluators

The projects are characterized by high resource input and strong partnerships with stakeholders, making it practical for smallholder setups, particularly in extension services. It has room for more partnerships and the potential to improve farm productivity. However, some commenters expressed concerns about its pacing and the need for evidence of progress. Nevertheless, almost all the projects were considered viable projects for smallholder farmers with scalability potential. The inclusion of a carbon footprint in the CNN models is seen as a positive aspect of the projects' implementation. Most evaluators find the projects impactful and on track, making it an overall good project that requires close monitoring during implementation.

The comments of the external participants on the effectiveness of the AI4AFS project during the parallel session at the AfricaAI Conference 2023, show that the overall project implementation is a success. The network valued the feedback from the grantees on how the management of the project has evolved and the overall outlook of the project implementation. The feedback videos from the grantees are found in the following link: AI4AFS grantees project implementation feedback video 1 and video 2. The pictures, list of attendees and programme of the AI4AFS session during the AfricaAI conference 2023 are found in the links for photos, list of attendees and session programme.

Impact on Target Beneficiaries
The project has positively impacted 100 farmers across the 8 countries such as improving access to education, understanding improved water monitoring and conservation systems, and improved capacity to develop, deploy, and scale responsible AI tools in agriculture and food systems in Africa.

Conclusion
The mid-term evaluation indicates that the AI4AFS project is on track to achieve its objectives. Grantee selection has been transparent, and performance is generally commendable. The project has had a positive impact on beneficiaries. Through the review, the project management committee will further enhance the project's effectiveness and ensure its successful completion.