GENERATIVE AI FOR AGRICULTURE ADVISORY

Locations	Ethiopia, India, Kenya
Dates	15/04/2024 - 31/05/2027

Summary

Generative Artificial Intelligence (GenAI) is starting to reshape how advice is accessed, shared and created in the agriculture sector. It can localize digital advisory messages and increase the accessibility of such messages to reduce the digital divide compared to traditional, non-AI communication methods. Using natural language processing (NLP) and large language models (LLMs) offers new potential to disseminate complex scientific information more widely, in local dialects and through various formats, transforming accessibility. This project is a multi-partner initiative that will explore how GenAI tools can improve the quality and inclusivity of agricultural advice for smallholder farmers. CABI will lead on the delivery of advisories, data governance and ethical guidance.

The problem

Smallholder farmers often lack access to trusted, localised and timely agricultural advice. Many digital tools exist to try to combat this problem by delivering advice, but these can be challenging to access due to the digital divide that exists in accessing digital devices, language and digital illiteracy.

While generative artificial intelligence (GenAI) tools offer the potential to close this gap, risks such as misinformation, content bias, weak licensing structures and regulatory uncertainty remain. Without governance and inclusive design, AI-generated advice may reinforce inequalities and heighten the risks identified.

This project will aim to address inequalities by improving how content is sourced, shared and governed across GenAI systems to make digital advisory tools safer, more relevant and more equitable.

What we are doing

The Generative AI for Agriculture Advisory (GAIA) project is a multi-partner initiative. It explores how generative AI tools, including large language models (LLMs), can improve the quality and inclusivity of agricultural advice for smallholder farmers. The project aims to ensure AI-powered services are accurate, accessible, gender-responsive and ethically governed.

CABI contributes to the project by investigating how CABI-curated crop health content can be integrated into GenAI tools, such as GenAI chatbots, designing

licensing and data governance frameworks to help prevent misuse of AI, developing a GenAI Ethics Toolkit that will ensure fairness and transparency, and testing content for chatbot use in real-world settings.

CABI's role includes:

- Developing technical infrastructure to share content through advisory channels
- Leading the design and piloting of data governance and licensing frameworks
- Developing a GenAI Ethics Toolkit
- Conducting legal analysis of AI regulations across Kenya, India and Ethiopia
- Supporting content mobilisation and testing

GAIA takes a phased approach. Phase one tests the feasibility of a chatbot using CABI-curated agricultural content. Phase two focuses on scaling trusted content sharing, building a governance framework, and integrating real-time and multimodal data, for example, remote sensing, weather and historical data. It includes gender-responsive research and an evaluation of GenAI tool performance.

The broader partnership is developing a shared open-access corpus, tools to benchmark LLMs and dynamic AI-powered advisory services with field validation in multiple countries.

Results so far

Phase one was completed in 2024. CABI developed the technical infrastructure and licencing to share 463 content documents with project partners for training their chatbot. CABI tested content delivery through its own prototype chatbot and conducted user testing in Kenya and India. Over 90% of testers said they would use the tool regularly, seeing value in CABI content being delivered via a chatbot interface.

These early successes are being scaled in phase two, which will also deliver governance tools, an ethics toolkit, and legal and gender insights to shape the responsible use of GenAI in agriculture.

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