

EMPOWERING FARMERS TO SUSTAINABLE AGRICULTURAL PRODUCTIVITY IN WEST AFRICA: FESERWAM, A DIGITAL ADVISOR FOR FARMERS.

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ABSTRACT

Smallholder farmers in West Africa frequently face challenges in accessing critical information about agricultural inputs and practices. To address this issue, EnGRAIS/IFDC and CORAF, with funding from USAID, developed the *Fertilizer and Seed Recommendations Map for West Africa* (FeSeRWAM) mobile application. This application delivers customized agricultural recommendations tailored to specific agroecological zones, aiming to enhance yields and productivity with the goal of contributing to the fight to alleviate food insecurity. The FeSeRWAM platform is user-friendly, regularly updated, and offers an extensive range of over 620 agricultural input packages for 21 crops, 578 seed varieties, and 62 fertilizer grades across 15 ECOWAS countries, as well as Mauritania and Chad. It has already benefited more than 200,000 farmers, including 1,500 Togolese farmers who have successfully doubled their yields. The app's success is attributed to its regional customization and the collaborative effort of over 350 stakeholders. Additionally, it aligns with the ECOWAS Regional Agricultural Input Strategy. EnGRAIS has played a pivotal role in this initiative by training 50 regional trainers and 5,000 national trainers, reaching a total of 600,000 farmers to promote FeSeRWAM application. Moving forward, the project plans to further integrate a decision support tool (DST) based on economic returns for smart AIPs selection, to continue boosting agricultural productivity in the region.

Keywords: FeSeRWAM, Fertilizers, Seeds, Good agricultural practices, Agroecological zones.

INTRODUCTION

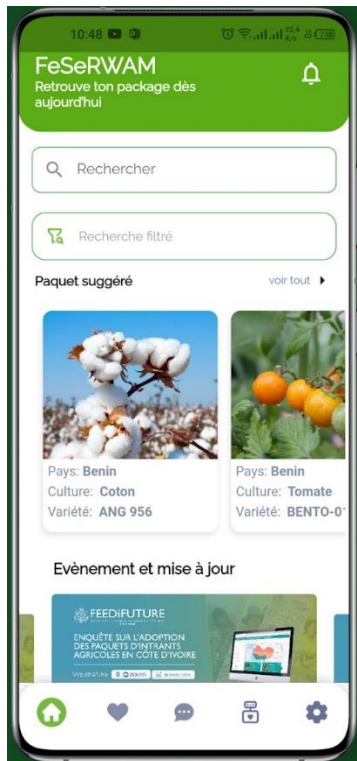
Agriculture remains a cornerstone of the West African economy, providing livelihoods for millions and contributing significantly to the region's GDP. Many smallholder farmers in West Africa continue to produce below capacity due to their inability to access the essential agricultural knowledge on the appropriate agricultural inputs (quality seeds and fertilizers) and practices to use to unlock their potential. Various efforts have been made over the years by value chain actors to change the trend, but not many of these efforts have yielded the expected results. To address these issues and boost agricultural productivity sustainably, technological innovations are increasingly recognized as essential. Among these innovations is FeSeRWAM. FeSeRWAM, an acronym for the Fertilizer and Seed Recommendations Map for West Africa, is a comprehensive digital platform developed to support farmers in West Africa. This digital tool aims to empower farmers by providing site-specific recommendations on seeds, fertilizers, and best agricultural practices, thereby promoting sustainable agricultural productivity in the region.



MATERIALS AND METHODS

The development of FeSeRWAM involved a collaborative effort between various stakeholders, including the International Fertilizer Development Center (IFDC) and the West and Central African Council for Agricultural Research and Development (CORAF). Funded by USAID through the Feed the Future *Enhancing Growth through Regional Agricultural Input Systems* (EnGRAIS) and *Partnership for Agricultural Research, Education, and Development* (PAIRED) projects, FeSeRWAM is a mobile application that captures, stores, and visualizes data on seed and fertilizer recommendations.

The application integrates data from over 350 stakeholders across national and regional organizations. It provides recommendations for more than 600 agro-input packages (AIPs) on 21 crops, and 578 seed varieties and 62 fertilizer grades for 15 ECOWAS countries plus Mauritania and Chad. The tool is designed to be user-friendly, enabling farmers, extension agents, and agro-input dealers to access critical information easily.



- **Technological Infrastructure:** . It is accessible via mobile applications on Android ([fesarwam – Applications Android on Google Play](#)), and iOS for iPhone and iPad ([Here](#)) devices. The entire system is hosted on a cloud platform, allowing for scalable processing power, data storage, and real-time analytics.
- **Data sources and analysis:** It utilizes big data technologies to process vast amounts of agronomic data to generate accurate and localized recommendations. The platform utilizes data from agricultural research databases. Advanced algorithms analyze the collected data to generate actionable insights, including seed and fertilizer recommendations, good agricultural practices and agroecological zones for more accurate and context-specific recommendations.
- **Training Materials and support:** Educational resources, including user manuals, video tutorials, and community workshops, were developed to ensure effective use of FeSeRWAM by farmers. These materials address both technological and agricultural literacy. Farmers receive training on using FeSeRWAM through workshops and online resources. Ongoing support is provided via a dedicated helpdesk and community forums.
- **User Interaction:** Farmers interact with FeSeRWAM through a user-friendly interface on their mobile devices. The platform provides personalized advice based on the specific needs of their farms.

RESULTS AND DISCUSSION

Results

Enhanced Knowledge and Practices

The digital platform played a crucial role in disseminating knowledge and best practices. Farmers indicated a 30% increase in their understanding of advanced agricultural techniques. The mobile application's guidance on good agricultural practices and nutrient management were particularly valued. FeSeRWAM has also promoted sustainable agricultural practices. The application has facilitated better resource management, reducing the environmental impact of farming activities.

Enhanced Productivity

Since its launch and its implementation, FeSeRWAM has demonstrated significant improvements in agricultural productivity in West Africa. The platform has enabled over 600,000 farmers to access vital information on improved seeds and appropriate fertilizers, leading to increased crop yields and enhanced food security. By providing site-specific recommendations, FeSeRWAM helps farmers make informed decisions, optimize input use, and adopt sustainable agricultural practices.

The tool's success is evident in the improved agricultural outcomes reported by users. For instance, farmers who utilized FeSeRWAM's recommendations have experienced higher crop

yields and better-quality produce. Data has indicated that farmers using the platform have achieved up to at least 20% increase in crop yields. In Togo, in collaboration with Institut Togolais de Recherches Agronomiques (ITRA) and the Institut de Conseil et d'Appui Technique (ICAT), the EnGRAIS project trained many extension agents to support farmers at the grassroots levels to use the FeSeRWAM platform and adopt the AIPs to increase their yields. Bakoundi Ayékénam Nadège, a rice and maize farmer, who is part of a 19-member cooperative at Akaglakopé, participated in one of the training programs on soil preparation, sowing, fertilizer application, and good practices for maintaining plots until harvest (all components of good AIPs) and doubled her yields. She said, “Before acquiring the new knowledge on the AIPs, farmers in my cooperative, Akaglakopé ZAAP, harvested one-and-a-half tons of rice per hectare and thought they had reached the peak, but after adopting the AIPs, they harvested up to three metric tons per hectare.”

Economic Impact

The platform has had a positive economic impact on farming communities. Farmers using FeSeRWAM have experienced higher incomes due to increased yields and reduced input costs. Additionally, improved market information has enabled better pricing decisions, further enhancing profitability.

Discussion

Empowering Farmers

FeSeRWAM represents a significant advancement in the digitalization of agriculture in West Africa by empowering farmers with timely and relevant information. The tool provides a robust support system that addresses both immediate and long-term challenges in agriculture. By leveraging technology to provide tailored agricultural advice, the platform addresses key challenges faced by farmers, such as low yields and limited access to quality inputs. The success of FeSeRWAM underscores the importance of digital tools in enhancing agricultural productivity and sustainability. However, the platform's effectiveness depends on regular updates. Ensuring that farmers are aware of and can access FeSeRWAM is crucial for its sustained impact. The innovative training programs and awareness campaigns can help increase the adoption of the tool among farmers and other stakeholders. Moreover, expanding the platform's capabilities to include more crops and regions can further enhance its utility. Collaboration with local agricultural organizations and continuous feedback from users will be essential in refining and improving FeSeRWAM.

Addressing Challenges

While FeSeRWAM has shown considerable benefits, challenges remain. Accessibility to technology in remote areas, variability in digital literacy, and infrastructure limitations are notable hurdles. Addressing these challenges requires continued investment in digital infrastructure, targeted training programs, and support for low-tech solutions.

Prospects

Looking ahead, FeSeRWAM can be enhanced with additional features such as agricultural-based technologies that improve Nutrient Use Efficiency (NUE) and integration of a Decision Support Tool (DST) based on economic returns for smart AIPs selection. Expanding its reach and functionality could further bolster agricultural sustainability and productivity in the region.

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