EMPOWERING FARMERS TO SUSTAINABLE AGRICULTURAL PRODUCTIVITY IN WEST AFRICA: FESERWAM, A DIGITAL ADVISOR FOR FARMERS
#11359

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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. FeSeRWAM App is a digital agricultural tool for West Africa, offering tailored Agricultural Input Packages (AIP) with recommendations on fertilizers, seeds and good agricultural practices based on country specific agroecological zones. Built on the FeSeRWAM web platform developed by IFDC and CORAF with USAID funding and technical inputs from National Agricultural Research Structures, the app provides guidance for over 650 AIP on 21 crops, 578 varieties and 62 fertilizer grades for 15 ECOWAS countries, as well as Mauritania and Chad. Designed for ease of use, the app allows farmers, extension agents, and agrodealers to access critical information offline and on the go. 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 the right information on appropriate agricultural inputs and practices to unlock existing potential, make better decisions and get more dividends on their investments. 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. Ideally, extension agents are supposed to provide this information to farmers. However, there are not enough extension agents, and those available often lack access to the right information on farm inputs. Meanwhile, the information available in research centers is not disseminated. In this condition, farmers often get their information from agrodealers and more educated people in their communities, but this actor is also struggle to find the correct information.

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 app 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.
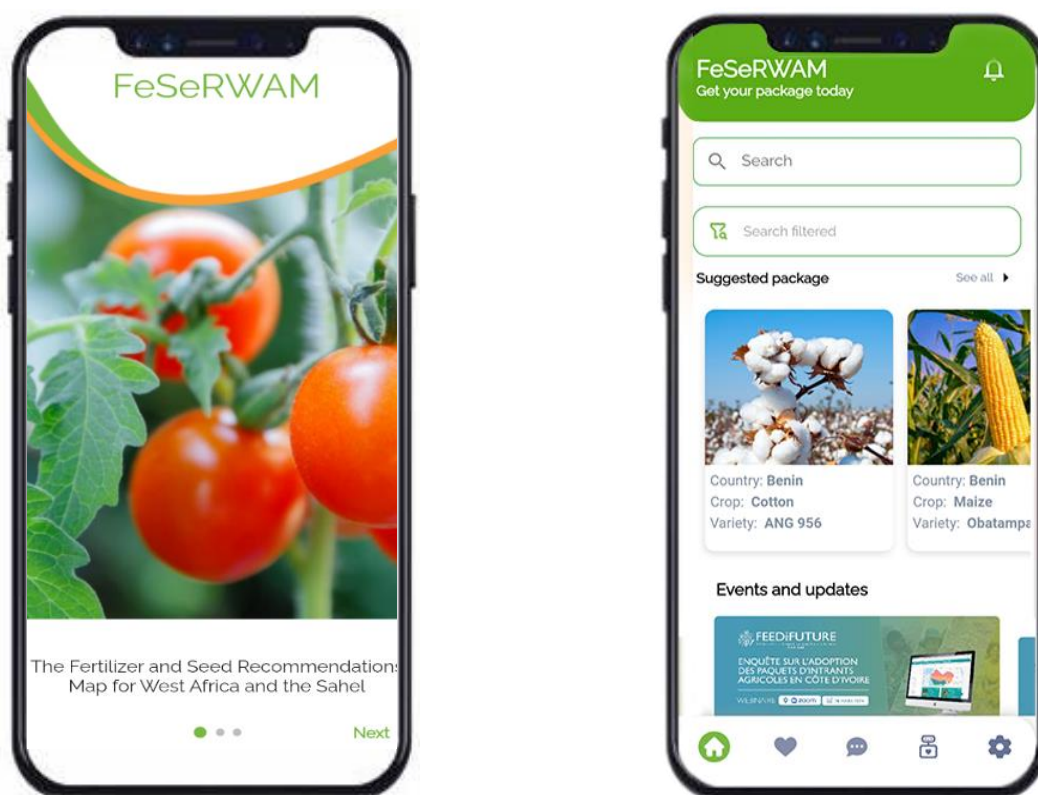
MATERIALS AND METHODS

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 App builds on the FeSeRWAM website's is ton and tons of agronomic data. It utilizes big data technologies, is mobile, is in the hands of the user, accessible instantaneously to deliver site-specific recommendations. The application integrates data from over 350 stakeholders across national and regional organizations. It provides recommendations for more than 650 agro-input packages (AIPs) on 21 crops, and 578 seed varieties and 62 fertilizer grades for 15 ECOWAS countries as well as 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 (feserwam – Applications Android sur Google Play), and iOS for iPhone and iPad (FeSeRWAM on the App Store (apple.com)) 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 information presented on the FeSeRWAM mobile app is sourced directly from the agricultural research institute's databases.
- **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 app provides personalized advice based on the specific needs of their farms.
- **Cost**: The mobile app requires a smartphone and an internet connection to use. Currently, it is free for users because it was developed as part of a project.

RESULTS AND DISCUSSION

Increased capacity of extension services

The FeSeRWAM app plays a key role in disseminating knowledge and best practices by extending the reach of agricultural extension services. The mobile application's guidance on good agricultural practices and nutrient management are particularly valued. FeSeRWAM also promotes sustainable agricultural practices. The application facilitates 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 app 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 specific recommendations, FeSeRWAM helps farmers make informed decisions, optimize input use, and adopt sustainable agricultural practices.

The FeSeRWAM mobile application has shown promising potential to enhance agricultural productivity through improved advice and guidance. While it may be premature to claim definitive yield increases directly attributable to the app, early indications suggest farmers who have adopted the recommended practices are experiencing positive outcomes.

For instance, in collaboration with the 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 in using the FeSeRWAM app and adopting the recommended agricultural best practices. Bakoundi Ayékénam Nadège, a rice and maize farmer who is part of a 19-member cooperative at Akaglakopé, participated in one of these training programs covering soil preparation, sowing, fertilizer application, and other good practices. She reported that, "after adopting these practices, her cooperative's rice yields doubled from one-and-a-half tons per hectare to three metric tons per hectare."

Economic Impact

FeSeRWAM has shown positive economic potential for farming communities. There is a direct cause between using the app and increased incomes has not yet been conclusively demonstrated,

the improved agricultural practices enabled by FeSeRWAM can reasonably be expected to lead to enhanced productivity and farm revenues.

DISCUSSION

Empowering Farmers

FeSeRWAM represents a significant advancement in the digitalization of agriculture in West Africa by empowering farmers with timely and relevant information. By leveraging technology to provide tailored agricultural advice, the App addresses key challenges faced by farmers, such as low yields and limited access to quality inputs. The FeSeRWAM is designed to be accessible to all farmers including women and youth. The FeSeRWAM is especially friendly to women and youth users. The success of FeSeRWAM underscores the importance of digital tools in enhancing agricultural productivity and sustainability. However, the FeSeRWAM'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 app'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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