

FERARI Quarterly Newsletter

January-March 2020

About FERARI

The African continent is in dire need of balanced fertilizers for its sustainable agricultural intensification. Widespread adoption of balanced fertilizers requires a transformation of the fertilizer and food systems that must be driven by evidence-based agro-technical perspectives embedded in multi-stakeholder processes. To support this transformation, IFDC, OCP, and the Mohammed VI Polytechnic University (UM6P) have partnered to implement the Fertilizer Research & Responsible Implementation (FERARI) program, which began in September 2019.

The objective of this public-private endeavor is to develop the evidence base for a systematic approach to support widespread adoption of balanced fertilizers by farmers in the less developed markets of sub-Saharan African countries – specifically Ghana – as a means to improve their food and nutrition security. The project’s sub-objectives include:

- Developing on-the-ground experience in pre-competitive activities to create appropriate conditions for strong market growth of balanced fertilizers and their widespread adoption.
- Converting tacit knowledge into formal knowledge to allow more effective up- and out-scaling of the FERARI approach.
- Preparing highly qualified M.Sc., Ph.D., and postdoctoral researchers to enter the international development market.
- Strengthen the scientific capabilities of all partners.



Part of the FERARI Team Attend an AFO Meeting

The implementation track will be executed to understand the impact of balanced fertilization on crop responses and to demonstrate the benefits to farmers. Actors along the value chain will be involved in the development of the fertilizer chain to ensure fertilizer access by farmers. Finally, a platform of multiple relevant stakeholders will be convened to discuss and align the actions of stakeholders in the fertilizer and food value chains for smooth operations.

The research and the implementation tracks will be mutually reinforcing. Ph.D. and postdoctoral researchers will perform in-depth studies to understand the agro-technical improvement, effectiveness of (novel) fertilizers, economic viability of the system, and the processes needed to align multiple stakeholders to act in an orchestrated manner.

The program will build strong linkages with the Ghanaian government's Planting for Food and Jobs program and Fertilizer Expansion Program. The Ph.D. and postdoctoral researchers will be trained in a transdisciplinary manner to help them to think outside their own disciplines, strengthen their interaction with scientists from other disciplines, and develop a sense for interaction with stakeholders in the field to fine-tune their research insights into practical applicability. FERARI will embed its on-the-ground implementation activities into ongoing developments of the fertilizer sector to ensure long-lasting impact.

The research will be (co-)supervised by staff from Wageningen University & Research (WUR), University of Liège (ULiège), University of Ghana (UG), Kwame Nkrumah University of Science and Technology (KNUST), University of Development Studies (UDS), UM6P, and IFDC.

For a more detailed description of FERARI see ifdc.org/ferari.

Overall Coordination in Ghana

Williams Kwame Atakora (Ph.D.) is the coordinator of the FERARI project. Williams has extensive experience in agronomic science and in implementation programs, with an outstanding reputation in Ghana in both policy and scientific circles. He strengthens IFDC's capacity in developing science-based evidence for effective implementation strategies in food and fertilizer value chains.

Next FERARI Coordination Meeting: August 24-28, 2020 in Ghana

The next meeting with all involved partners will be held in Ghana the week of August 24-28, 2020. We will develop a dynamic programs both in Accra to interact with most relevant stakeholders and in Tamale for field visits and farmer interactions.

Ph.D. Candidates

A major component of the FERARI program is the involvement of five Ph.D. candidates who will conduct their research in topical areas of the implementation component, including:

- Ph.D. 1: Analytical framework for fertilizer recommendation
- Ph.D. 2: Effects of fertilization on productivity and nutritional quality of crops
- Ph.D. 3: Socio-technical fertilizer interventions on farm productivity
- Ph.D. 4: Socio-economic factors enhancing sustainable agricultural intensification
- Ph.D. 5: Social differentiation and interdependence in soil fertility systems

Selected candidates will benefit from a full scholarship through the UM6P of Morocco for a sandwich program at WUR in the Netherlands. Deadline for applications was March 15, 2020, and we expect to finalize the selection procedure by mid-April. Candidates will be contracted by UM6P by the end of April 2020.

Preparatory Meeting

The Preparatory Meeting in Ben Guerir, Morocco, was successful in introducing the aims of the program and presenting the Ghanaian enabling environment. The discussions, held by a vibrant team, led to detailing the research topics, identifying drivers for actual change, and building common ground about program principles.

The following are a few of the noteworthy principles embodied by this public-private program:

- **Neutrality and transparency** are key in allowing optimal learning, as results may lead to controversies that have to be dealt with.
- **Confidence and trust** are essential for maximal output. For example, data and information should be shared among students and between public and private partners, and the data should be managed optimally.
- Our program will “**plug in**” its activities in currently ongoing processes to accelerate the developments, which will continue with or without the program intervention, and allow a smooth exit.
- Smart approaches are needed in order “**not to think for the farmers,**” but to entice them with innovative solutions and stimulating enabling conditions that can readily be adopted to improve their livelihoods.
- The generated knowledge should be widely **disseminated** to reach a broad range of actors, including the scientific community and **utilized** in implementation activities.
- **Research methodologies** may need to be adapted to actual practices.

Activity Workshop

Together with actors in Ghana, tangible activities from various ongoing programs that could be linked to or supported by FERARI were identified during the Activity Workshop on November 7, 2019, to kickstart the activities. These included understanding of yield responses to fertilization, tracking farmers response to balanced fertilizers distributed through the Planting for Food and Jobs program in 2019, determining the possible configuration of a Ghana Fertilizer Platform, and determining price transmissions in the marketing of the rice and maize. Almost all of these activities are currently being executed.

Local Actors Meeting

An activity launch meeting in Tamale, Ghana, on January 22, 2020, brought together stakeholders in the fertilizer value chain in Brong-Ahafo and Northern regions. These included officials from the Department of Agriculture at the Ministry of Food and Agriculture (MoFA) from Northern and Brong-Ahafo regions, agro-input dealers, peasant farmers association members, selected farmer-based organizations from the two regions, and researchers from the Council of Scientific and Industrial Research (CSIR)-Soil Research Institute and Savanna Agricultural Research Institute (CSIR-SARI). The meeting introduced the FERARI program to potential stakeholders that can be linked to or supported by FERARI. We sought to obtain insights and suggestions on site-specific fertilizer recommendation research and approach, how best to develop the fertilizer value chain to serve the interests of all involved, and how the objectives of

stakeholders in the fertilizer value chain could be served through a Ghana Fertilizer Platform. Interestingly, we learned that over 4,000 fertilizer trials were conducted in 1974 by the Food and Agriculture Organization of the United Nations (FAO) with major crops (especially maize and rice) using NPK; this resulted in fertilizer recommendations for these crops that have been used in Ghana until recently, when they were updated by the Ghana Soil Health Consortium. Participants suggested that the current fertilizer recommendation trials in Ghana should be scientifically sound and site specific.

AFO/VIFAA Meeting

FERARI participated, through a presentation and discussions, in the Ghana Fertilizer Technical Working Group (FTWG) 2020 workshop and the Development Gateway-led Visualizing Insights on Fertilizer for African Agriculture (VIFAA) kick-off meeting at Elmina, February 11-13, 2020. The meeting brought together key fertilizer industry stakeholders from both the public and private sectors across Ghana. IFDC, through the AfricaFertilizer.org (AFO) initiative, has been partnering with the Ghanaian CountrySTAT program of the FAO and the West Africa Fertilizer Association (WAFSA) to generate and disseminate reliable and up-to-date official statistics on fertilizers produced, imported, exported, and consumed in countries within the West Africa region and beyond. FTWG reviews country-level data and presents statistics results tables for validation by the National Technical Working Groups on an annual basis before publication. Development Gateway co-organized the workshop to find techniques to meaningfully display fertilizer data meaningfully on a dashboard, which can be used for planning and decision-making by stakeholders.

Ghana Fertilizer Expansion Program

The FERARI team, together with the IFDC-led Enhancing Growth through Regional Agricultural Input Systems (EnGRAIS) project for West Africa, which aims to strengthen private sector development and to harmonize fertilizer policy, had the privilege to participate at the Technical Committee Meeting of the Ghana Fertilizer Expansion Program (GFEP) in December 2019. Drawing on IFDC's experience in developing fertilizer platforms, such as the Kenya Fertilizer Platform (KeFERT), we outlined a possible profile of a platform in Ghana and pledged a staff to identify, in close interaction with stakeholders, the possible configuration of a Ghana Fertilizer Platform. The Government of Ghana also invited the FERARI team to the podium for the official launching of the MoFA-OCP Foundation project at the Soil Research Institute and to meet the Minister of Food and Agriculture, Dr. Owusu Afriyie Akoto, H.E. Ambassador of the Kingdom of Morocco to Ghana, Imane Ouadi, and other OCP, UM6P, and MoFA partners.

On-Station and On-Farm Trials

Crop production requires a supply of both macro and micronutrients. However, much attention and many fertilizer programs in sub-Saharan Africa have focused on the replenishment of only major nutrients, mainly through soil application. As a result, the concentrations of several micronutrients in grains of crops have declined considerably over the last five decades, negatively affecting nutritional quality and exacerbating malnutrition. Given the important roles micronutrients play in crop production and human nutrition, non-application of such nutrients is not sustainable while seeking to enhance nutrition-sensitive agriculture. Apart from the quantity and the composition of fertilizers, the mode of nutrient application plays a key role in nutrient uptake by plants.

Consequently, the FERARI program is conducting 180 on-farm and 45 on-station trials in the Brong-Ahafo and Northern regions of Ghana (Figure 1) to test new combinations of fertilizer nutrients. Specifically, the trials explore the application of micronutrients, either via foliar or soil application, to improve maize, rice, and soybean yields as well as their nutritional content. The FERARI program has partnered with KNUST and CSIR-Soil Research Institute in the Ashanti region (the transitional agroecological zone), as well as CSIR-SARI and UDS in the Northern region of Ghana (the Guinea Savannah agroecological zone), to conduct these trials.

Yield Responses

Samuel Bua is an intern from UM6P studying for a master’s degree in fertilizer science and technology. He is currently engaged in an internship with the FERARI project, working on fertilizer yield response in Ghana. He carried out an initial literature review on fertilizer response of cereals in Ghana and has since drafted his proposal. He is meeting with various groups (OCP Ghana, Soil Research Institute in Kumasi, SARI in Tamale, and UG in Accra) identified by FERARI to help with fertilizer response data on the priority crops (maize, rice, and soybean). He will also receive instruction on spatial analysis as well as selected statistical and graphical software to aid in his work. Thesis supervisors are Dr. Dilys MacCarthy (UG), Dr. Khalil El Mejahed (UM6P), and Dr. Prem Bindraban (IFDC).



Selected FERARI Project Sites

Multi-Stakeholder Platform for the Fertilizer Value Chain

Toyib Aremu, a student at UM6P seeking his master’s degree in fertilizer science and technology, is conducting research on multi-stakeholder platform approaches to developing the fertilizer value chain in Ghana. This qualitative research involves understanding fertilizer value in Ghana, establishing the key constraints and challenges faced by the actors, and determining whether and how a multi-stakeholder approach can be used to find sustainable solutions for the effective functioning of the fertilizer value chain. The goal is to ascertain the feasibility of creating a multi-stakeholder platform for the fertilizer industry and the design of a viable Ghana Fertilizer Platform. Toyib completed his proposal, and actual field work is planned for the end of March 2020. He will work closely and with Yakubu Iddrisu on the Ghana Fertilizer Platform. Thesis supervisors are Dr. Comfort Freeman (UG), Dr. Abdelali Laamari (UM6P), and Dr. Prem Bindraban (IFDC).

Ghana Fertilizer Platform

The Ghana Fertilizer Platform depicts a multi-stakeholder forum of key actors and industry players in the fertilizer sector in Ghana. It is expected to be a public-private partnership initiative and a rallying point for

discussion of policies and regulatory environment issues in the optimization and development of the fertilizer sector value chain, production, marketing, and quality control in Ghana. It will be a major part of the implementation of Ghana's Fertilizer Expansion Program and a five-year strategic fertilizer sector development plan. Yakubu Iddrisu joined the FERARI team tasked to design the national fertilizer platform through interaction with stakeholders. Yakubu is an international development policy and project management specialist, with over 10 years of experience in agriculture sector development projects in Ghana, specializing in agricultural value chains, public-private dialogue, and multi-stakeholder forums. Yakubu was part of a team that shepherded the umbrella seed sector stakeholders' platform, the National Seed Trade Association of Ghana (NASTAG). Yakubu has also worked as Project Manager, Agro-Dealer Support, leading the team in capacity-strengthening activities for private agro-inputs sector development in the Northern Region. Since joining FERARI in February, Yakubu has developed a six-month activity work plan (February-August 2020). Activities have already begun on the national fertilizer platform study, comprising document/literature review and interactions with stakeholders in the fertilizer sector.

Fertilizer Cost Components

Nnaemeka Odionye is an intern from UM6P studying for a master's degree in fertilizer science and technology. The main objective of the study is to determine the level of inefficiency in Ghana's fertilizer value chain and the effect of cost components on the final fertilizer price. The premise is that, if fertilizer marketing agents can be more efficient and obtain much cheaper sources of finance, the entire fertilizer value chain will be more efficient, especially in comparison to fertilizer subsidies. Analyses of the vertical and spatial fertilizer market integration as well as fertilizer cost components at each stage of the value chain will determine the validity of this premise. Thesis supervisors are Prof. Saa Dittoh (UDS), Dr. Martin Jemo (UM6P), and Dr. Prem Bindraban (IFDC).

Price Transmission in the Rice Sector

Priscilla Korantemaa Asante, an intern affiliated with the master's program at UDS in Tamale, is studying the relationship between marketing of farm produce and farmers' reluctance to invest in fertilizers and other yield-improving inputs. She seeks to analyze rice market linkages and price transmissions as well as the challenges faced by all agents in the locally produced rice value chain in Ghana. The goal is to generate informed suggestions of avenues to increase the demand and consumption of locally produced rice in and outside the country. Priscilla has collected considerable secondary data on prices and production for several years and is interviewing rice marketing agents (millers, wholesalers, retailers, and consumers) as well as farmers in the field. She is supervised by Dr. Saa Dittoh (UDS) and Dr. Prem Bindraban (IFDC).



Priscilla Asante, FERARI intern, at a rice processing and aggregation center

Governmental Balanced Fertilizer Distribution

The use of site- and crop-specific fertilizer is being tested in Ghana following the distribution of basic fertilizers with zinc (NPK 15-20-20+0.7 Zn for cereals; NPK 12-30-17+0.4 Zn for legumes; NPK 17-10-10 for cassava) for the first time during the 2019 production season through Ghana's Planting for Food and Jobs program. In consultation with Ghanaian actors, FERARI agreed to obtain field information to understand farmers' perception of the efficacy of the balanced fertilizers compared with the previous season. The study will be undertaken before the start of the 2020 production season in the northern part of the country, where most of the fertilizers were distributed. Following a study on the distribution of the balanced fertilizers to the various districts and municipalities, a scientific sampling of districts/municipalities, communities, and individual farmers (men, women, and youth, with different farm sizes) will be undertaken for a survey to be conducted in April and May 2020.

Post-Doctoral Research at University of Liège

Discussions were held with ULiège in February 2020, based on input from the Coordination Meeting in October 2019, on a range of scientific arguments and Ghana-specific production conditions. An agreement was made for the first postdoctoral researcher to emphasize phosphorus (P)-related products and for the second researcher to focus on foliar products. The aim is for the scientists at ULiège to draft a proposal in coordination with FERARI scientists and to allow the postdoctoral researchers to present their ideas at the Coordination Meeting in August 2020 in Ghana. Pr. Frédéric Francis, Dean of the Gembloux Agro-Bio Tech Department, was pleased with the challenges that we aim to address in the FERARI program and his university's role.

FERARI

FERTILIZER RESEARCH & RESPONSIBLE IMPLEMENTATION

To find out more about the FERARI program, visit these sites:



FERTILIZER RESEARCH & RESPONSIBLE IMPLEMENTATION



Contact

Prem Bindraban
Williams Atakora

pbindraban@ifdc.org
watakora@ifdc.org

FERARI Program Partners

