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Transforming Africa's Agriculture through Enhancing Commercialization of Agricultural Research Products

The case of Rice Technology

By : *FARA TAAT Capacity Development and Technology Outreach and Rice Value Chain Compact*

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Forum for Agricultural Research in Africa (FARA)

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About FARA

The Forum for Agricultural Research in Africa (FARA) is the apex continental organisation responsible for coordinating and advocating for agricultural research-for-development. (AR4D). It serves as the entry point for agricultural research initiatives designed to have a continental reach or a sub-continental reach spanning more than one sub-region.

FARA serves as the technical arm of the African Union Commission (AUC) on matters concerning agricultural science, technology and innovation. FARA has provided a continental forum for stakeholders in AR4D to shape the vision and agenda for the sub-sector and to mobilise themselves to respond to key continent-wide development frameworks, notably the Comprehensive Africa Agriculture Development Programme (CAADP).

FARA's vision is to "Reduced poverty in Africa as a result of sustainable broad-based agricultural growth and improved livelihoods, particularly of smallholder and pastoral enterprises" its mission is the "Creation of broad-based improvements in agricultural productivity, competitiveness and markets by strengthening the capacity for agricultural innovation at the continental-level"; its Value Proposition is the "Strengthening Africa's capacity for innovation and transformation by visioning its strategic direction, integrating its capacities for change and creating an enabling policy environment for implementation". FARA's strategic direction is derived from and aligned to the Science Agenda for Agriculture in Africa (S3A), which is in turn designed to support the realization of the CAADP vision.

Disclaimer

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Background

The Forum for Agricultural Research in Africa (FARA), the African Forum for Agricultural Advisory Services (AFAAS), IITA, and Africa Rice organized a technical webinar on September 16, 2020, as part of the Technologies for African Agricultural Transformation (TAAT) Program of the Feed Africa initiative funded by the African Development Bank (AfDB).

FARA is leading the enabler compact for Capacity Development and Technology Outreach (CDTO) complementing the commodity compacts, such as the Rice Value chain led by the Africa Rice by acting as a process facilitator in the delivery of the proven technologies at scale.

FARA has so far done so through training of trainers (TOT) for Innovation Platforms (IPs) facilitators to help establish Innovation Platform (IP) as the main model for implementing TAAT. In addition, the CDTO Enabler Compact is supporting the compacts develop modular outreach materials for scaling of technologies within these local innovation platforms. Instruments have also been developed to assist the IPs identify their capacity development needs.

Brief overview of the Rice Value chain under TAAT

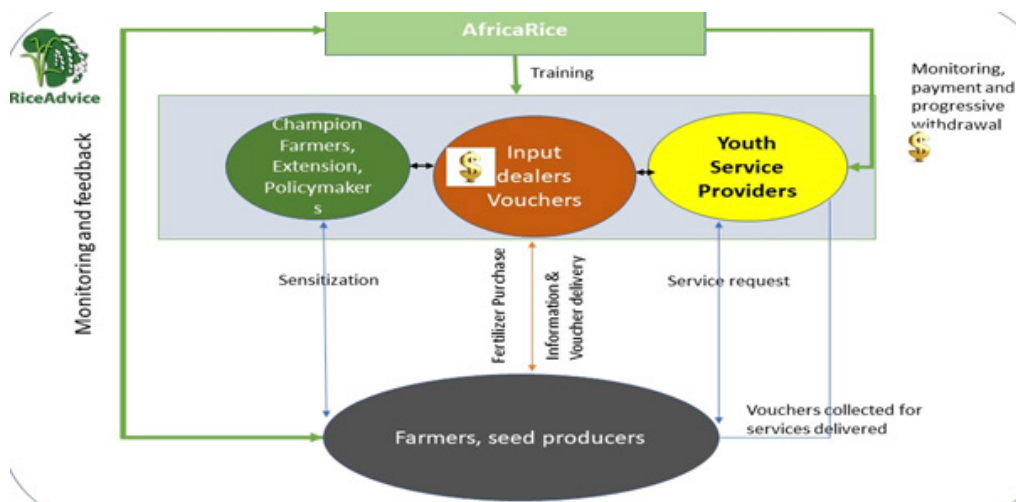
The Rice Compact of TAAT is paving the way for rice transformation in sub-Saharan Africa by promoting locally-adapted high-yielding rice varieties and hybrids developed by the Africa Rice Center. Due to low productivity in Sub-Saharan Africa, rice consumption outstrips production; for example in 2018, while 32.925 million metric tons of rice was consumed in the region, only 18.628 million tons of milled rice was produced. This indicated that there was 42% production-consumption gap and to fill the demand-supply gap, 13.985 million tons of milled rice was imported at the cost of US\$ 5.9 billion. Some of the factors that contributed to the low productivity of rice include: low access to climate-smart high yielding rice varieties, use of obsolete genetic materials, use of traditional farming practices and lack of equipment for land preparation and processing, low access to credit, inputs, high post-harvest losses, low quality of locally processed rice, weaknesses in the rice value chain and unfavorable policy environment. The objectives of the TAAT Rice Value Chain Compact were to: obtain 25% yield increase in rice production to reach over 2.26 million beneficiaries of these, 30% of whom are women using productivity enhancing technologies and innovations in the rice value chain. The eight target countries for scaling up of the rice technologies are: Benin, Cameroon, Cote d'Ivoire, Ghana, Madagascar, Nigeria, Senegal, and Uganda. The four deployed technologies that enhanced productivity and quality in the rice value chain compacts were: Improved climate-smart



rice varieties and hybrids, Good Agricultural Practices (GAP) and RiceAdvice, ASI thresher (a postharvest technology) and GEM rice

Business Opportunities Identified in the Rice Value Chain

The hybrid rice seed production can be a profitable business for seed companies and create employment opportunities for Africa's youth as well as women. Input delivery, seed production, service provision, extension service provision, and rice farming etc are the business opportunities which have been identified in the rice value chain for African youth and women.



The technology with a potential for commercialization: GEM Par-Boiling rice technology

Most rice processors, especially rural women in Africa, adopt traditional parboiling practice. The traditional parboiling process is laborious, time-consuming and unsafe, producing rice with impurities, broken, burnt and discoloration of the grain and undesirable smell. It also requires lots of firewood and water. To overcome the above postharvest obstacles, the GEM Par-boiling rice technology was deployed by the Rice Value Chain Compact.

The GEM Par-Boiling rice technology is grain Quality-enhancer, energy efficient and durable material which combines a uniform

steam par boiler and an improved parboiling stove. It has labor saving devices, either a rotational hoist or a chain hoist system for paddy weights less than 50 kg or paddy weights between 50-100kg respectively. The GEM parboiling technology has higher output rate of up to 25 tons of milled rice per month with high quality (lighter and uniform color, absence of heat-damaged grains and impurities, low levels of broken fractions). It reduces expenditure on firewood from 1.83 to 0.64 USD per 100kg of paddy parboiled and reduces the steaming time from about 60-90 min to 20-25 min per 100kg of paddy.

Internal rate of return (IRR) of the GEM parboiling technology is 70% compared to 14% for the traditional technology. The other benefit of parboiled milled rice is the high contents of B-Vitamins, minerals and has slower digestive and lower glycemic properties compared to white milled rice. In doing so, women who are using the GEM parboiling technology do not suffer from heat burns and smoke related sicknesses. The technology also provides hygienic conditions, reduces drudgery and significantly reduces

or eliminates the use of fire wood and consequently reduces deforestation. The paddy soaking tank is made from stainless steel with a false bottom, a water discharge point and a paddy discharge point and also the par boiler has a stainless steel mesh basket that sits on a support in the stainless steel tank. The stove is an improved rocket stove made of baked clay bricks with special ventilation and protects users from heat and smoke exposure.



During steaming, boiling water in the tank produces vapor that steams the paddy in the mesh basket. The steamed paddy will dry on the improved drying cemented floors with walkways to reduce contamination.

A business path-way towards commercialization

A business pathway/framework for business clearly indicates that employment opportunities for youth, men and women exist in the rice sector to attract them into the job market. The business framework describes how equipment manufacturers or equipment suppliers are trained to fabricate and supply equipment to the GEM rice parboiling system for the adoption of the GEM rice parboiling technology. The GEM rice parboiling system also provides opportunities to millers, traders, women par boilers and youth service providers to produce and supply cleaner and

higher-quality parboiled and milled rice to the market or to consumers.

AfricaRice, NARIs, NGOs, other development partners, policy makers, microfinance institutions and multi-stakeholder actors who are linked to the Innovation Platforms (IPs) in the rice hubs play great roles in awareness and demand creations, capacity development, monitoring and evaluation, promotion and dissemination of technology, which also enhance market access.

Framework for Businesses in GEM Rice parboiling technologies: Quality parboiled rice for national and regional markets

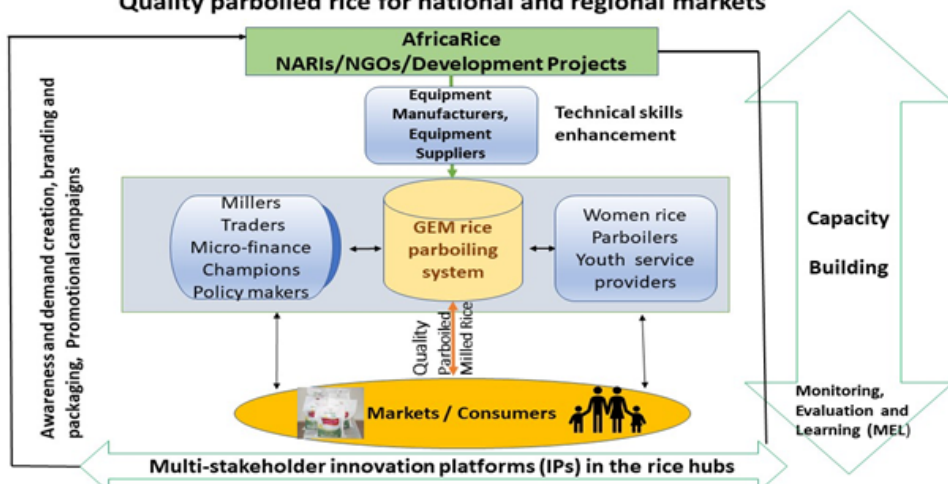


Figure 1: The business pathway in the Rice value chain

Experience from the field and Beneficiaries

Mr. Joshua Jonathan, who is a beneficiary of the rice compact in Nigeria, mentioned that he used to sell his paddy rice to middlemen before he joined the rice IP. As the current chairman of the IP, he has learnt how to be innovative, to identify problems and look for solutions. His production has so far increased

by 64% since his previous production was 4.3 metric tons. However, since he joined the IP, his production capacity increased to 6.7 metric tons. He also mentioned that within the IP, women are mostly involved in buying paddy for milling, while the youth are mainly involved in seed production.



Contact address:

If you are interested to start your business in Rice farming, please contact the following institutions and people

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If you want to learn more about Rice farming please visit the following sites:

<https://www.africarice.org/>

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