Agriculture Technologies for a Resilient Crop and Livestock Production System in West Africa.

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ABSTRACT

The West Africa food system is highly challenged due to; climate change, land degradation, limited access to modern agricultural technologies, extension services, finance, etc. This has led to low productivity and heavy reliance on food imports, weak exchange rates, unemployment, poor livelihoods and food insecurity. Despite investment agriculture research and development over the years, access to technologies and innovations remains limited due to weak extension systems and low private sector participation. The introduction of agriculture technology parks has therefore become the game changer where through strategic partnerships, massive awareness has been created leading production and supply seeds and other technologies. This paper therefore highlights the concept of agriculture technology parks and its ability to make technology closer to end users through effective partnership with private sector and other stakeholders.

INTRODUCTION

The contribution of agriculture to Gross Domestic Product (GDP), employment, food security and export earnings in West Africa continuous to be significant and a major driver of socio-economic development. Collier and Dercon (2014) indicated agriculture is the mainstay of Sub-Sahara African and contributes substantially to Gross Domestic Product (GDP) and a source of livelihood.

The sector is however not resilient to climate change, biotic and abiotic stress, supply chains disruption and other challenges. This has led to low productivity, high incidence of poverty and food insecurity with a threat to livelihood and socio-economic development which has been exacerbated due to climate change. West Africa has therefore become one of the most vulnerable regions to climate shocks characterised by high levels of weather and climate-related risks (Zougmor´e et al., 2016; Nangombe et al., 2018).

Countries in an attempt to response to these challenges have established national agriculture research institutions responsible for the development of innovative and resilient agriculture technologies. Through scientific processes, these institutions in collaboration with their partners have develop several technologies and practices capable of improving resilience of the West Africa food system. These technologies include improved crop varieties, production practices, pest and disease management options, animal breeds, feeding systems, animal health practices and many more.

Despite the achievements of these research institutions over the years, awareness of the developed technologies still remains low as well as adoption. This has created low productivity with its associated risk to the food system of the sub-region. Couple with this is the limited

access to agriculture inputs, finance and efficient markets limiting the profitability of food systems and making them less resilient and sustainable. This is has led to food insecurity, limited access to raw material for industrialization and high dependance on food imports.

To change the narrative, Agriculture Technology Parks (ATP) have been introduced by the West and Central Africa Council for Agriculture Research and Development (CORAF) to improve technology access. This has become the main scaling tool in the sub-region and currently being implemented in nine West and Central African countries namely; Senegal, Benin, Mali, Togo, Burkina Faso, Niger, Chad, Sierra Leone and Ghana. This paper therefore highlights the concept of agriculture technology parks and its ability to bring technology closer to end users through effective partnership with private sector and other stakeholders.

METHODOLOGY

Data for this paper was extracted from 2024 country technical reports submitted to CORAF on agriculture technology parks. This comprise of data from eight West African countries who are part of the concept namely; Burkina Faso, Ghana, Sierra Leone, Senegal, Togo, Benin, Mali and Niger. Data was analyze using descriptive statistics with results presented in the form of tables and graphs.

RESULTS AND DISCUSSION

The concept of agriculture technology parks

An agriculture technology park is a technology scaling concept which involves the showcasing of proven agriculture technologies and innovations for productivity improvement. This concept consists of four main elements namely; technology showcasing, awareness creation, partnerships and capacity building. It was first introduced in West and Central Africa by CORAF under the iREACH initiative with support from the TARSPro and FSRP projects. These parks are hosted by centres of specialisation at the various national agriculture research institutions accredited by CORAF as specialist in a particular commodity. These parks are normally a minimum of a 1hectre field where proven agriculture technologies are displayed including; crop varieties, animals, production and management practices, post-harvest, mechanisation, etc.

Open field days are organised as part of the process to create awareness and advocacy for the use and promotion of these technologies. These open field days brings together different actors such as producers, processors, policy makers, development partners, etc for interaction and networking. Technology users are also offered the opportunity to witness the perform of these technologies and seek clarity where necessary. Individuals and groups also visit these parks to learn more about the technologies. Private sectors through a partnership arrangement also play a critical role in these parks.

Building resilience through agriculture technology parks

Several climate smart and high productivity technologies have been showcased in the parks such that 412 (Figure 1) proven agriculture technologies were showcase in the 2024 cropping season. The specific number of technologies that were showcase per country in the 2024

cropping season are presented in Figure 1. These technologies did comprise of cereals (rice, maize, millet, sorghum), vegetables (tomatoes, pepper, okra, etc), aquaculture, mechanization, root and tubers (potatoes, yam, cassava and cocoyam). This demonstrates the ability of West Africa to build a sustainable food system given the number of technologies developed by research organizations.

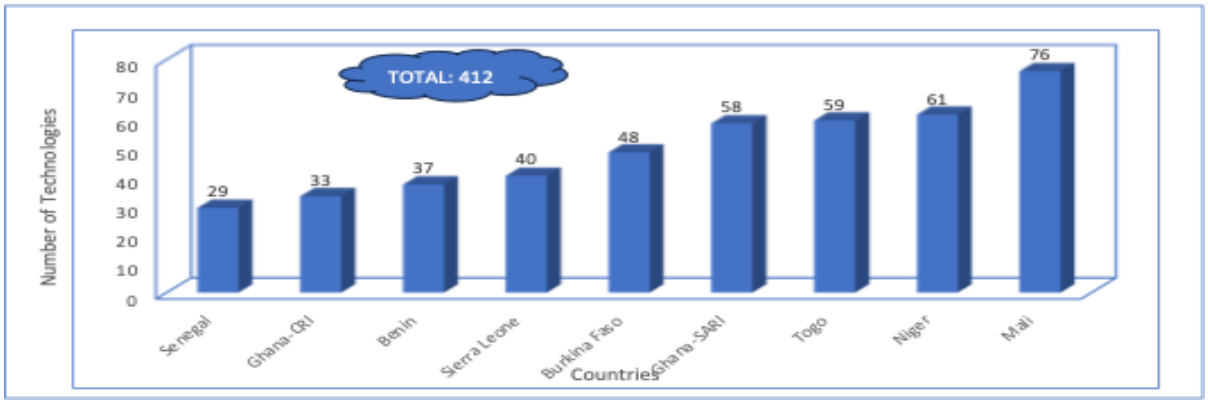

Figure 1: Number of technologies showcased

Level of awareness created through ATPs

Technology parks are gradually creating awareness on the ability of West Africa to build a sustainable food system. About 4,284 (Figure 2) persons visited the various technology parks and were exposure to different climate smart and sustainable technologies who expressed interest in these technologies. This was possible through open field days and guided visits to the parks. Visitors to the parks included students, producers, non-governmental organizations, development partners, policy makers, etc.

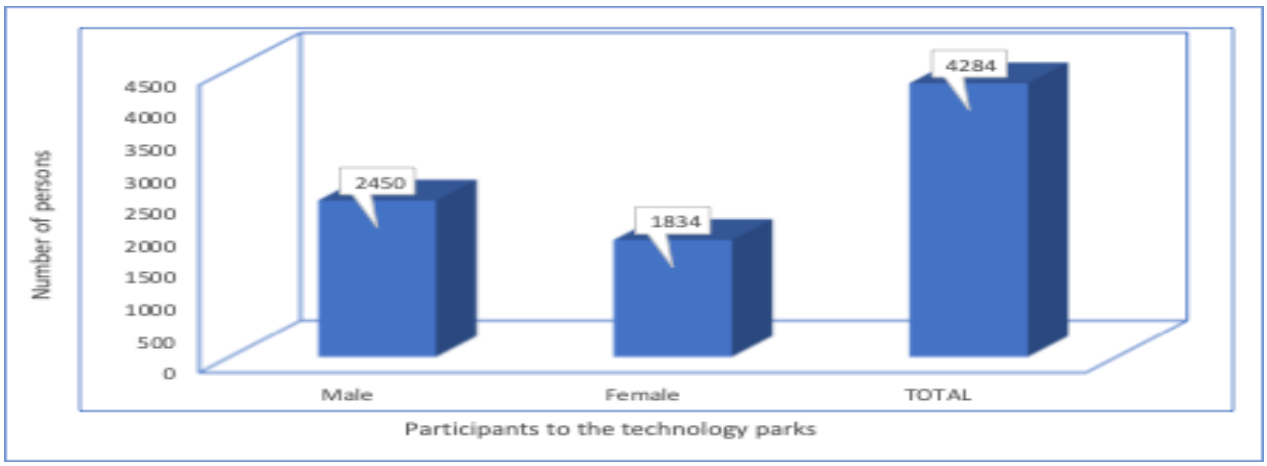

Figure 2: Visitors to technology parks for 2024.

Technology uptake from the parks for 2024

Improved crop varieties are some of the key technologies been showcased in the parks. These crop varieties are disseminated in the form of seeds to end users. Technology parks are managed by centers of specializations which are research institutions with the mandate for only the production and disseminate of early generation (breeder and foundation). As a result, 35.02tons

(Table 1) of foundation seeds were produce and supplied to certified seed produces in 2024. These were maize, rice, millet, cowpea, groundnut and pepper. Additionally, 6.9tons of certified seeds were produce and supply to farmers in partnership with private seed producers who has the mandate for the production and marketing of certified seeds.

Table: Quantity of seeds and planting material produce and supply

Foundation seed		**Certified Seed**		**Other planting materials**	
Crop	**Quantity (mt)**	**Crop**	**Quantity (mt)**	**Crop**	**Quantity**
Maize	10.9	Soybean	1.8	Orange flesh sweetpotatoes	14,850 (vines)
Rice	21.8	Groundnut	3.0	Maralfalfa grass for livestock	2,450 (bundles)
Millet	0.75	Millet	1.0	Cassava cuttings	10,000 bundles
Cowpea	0.56	Rice	1.1	Plantain	500 suckers
Groundnut	1.00	Pepper	0.0		
Pepper	0.009				
Sub-Total	**35.02**	**Sub-Total**	**6.9**		

Source: Country reports, 2024.

CONCLUSIONS AND RECOMMENDATIONS

Evidence from technology parks as presented in this paper clearly demonstrates the ability of West Africa to develop a sustainable food system. With over 412 technologies showcase in only 2024 across different commodity value chains, technology end users can be sure of becoming more aware of technologies developed by research organizations. The continues use of these parks can enhance technology access since more early generation seeds and other technologies can be multiple for end users. Effective partnerships should continue to be an integral part of the process where private sector is encouraged to support the multiplication and dissemination. Technology parks are therefore recommended as the main scaling strategy to be integrated into various extension systems.

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