Scaling Gender and Nutrition Sensitive technologies and innovations in West and Central Africa: Lessons learnt from the Market for Agricultural Innovation and Technology

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December • 2023

Info Note

Key messages

- Scaling up Gender and Nutrition Sensitive (GNS) Climate-Smart Agriculture (CSA) technologies and Climate Information Services (CIS) is essential to reducing gender inequalities and empowering women in agriculture and food systems in West Africa.
- AICCRA collaborated with its regional partner, CORAF to promote tested and sound GNS Technologies during the 2023 Market for Agricultural Innovation and Technology (MITA)
- Thirteen (13) potential gender- and nutrition-sensitive CSA and CIS innovations available for scaling up were presented by AICCRA country clusters in West Africa focusing on dry land cereals and livestock in Senegal, rice-based systems in Mali and roots and tubers in Ghana
- The event has resulted in an increased awareness of gender- and nutrition-sensitive CSA technologies and CIS, as well as their ability to strengthen agricultural sustainability and women's empowerment
- The event has resulted in a significant number of country representatives committing to raise awareness and disseminate gender- and nutrition-sensitive CSA and CIS through various events such as seminars, workshops, conferences to different stakeholders including local farmers, processors, seed producers, communities, women's cooperative groups, projects, etc.
- Participants committed to mainstreaming gender and nutrition perspectives in research and development projects and ongoing interventions, as well as in the field when working with farmers.

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BACKGROUND

Climate change continues to pose a significant threat to the agricultural and food systems in West and Central Africa, with serious implications for food and nutrition security. The impacts of climate change on food and nutrition security are multi-sectoral and affect the livelihoods of vulnerable populations in the region (Somda et al., 2017; Zougmoré et al., 2016). The agricultural sector, which is a critical source of employment for a vast majority of the rural population, remains highly vulnerable to climate change (Osabohien et al., 2019).

Given that agriculture in the region is mainly rainfed, climate change threatens the food and nutrition security of marginalized groups, particularly due to their inability to adapt to extreme changes. Indeed, climate change, combined with existing gender inequalities, increases the vulnerability of marginalized groups, such as women, youth and indigenous peoples, in particular the very poor, with limited access and control to productive resources (Anser et al., 2021; Huyer, 2018; Huyer et al., 2021). On the other hand, there is strong evidence that promoting sustainable agricultural innovation and social inclusion is critical to ensuring food and nutrition security in the region. Increased social inclusion and innovation may improve food security levels (Anser et al., 2021; Douxchamps et al., 2016). Full access to and control over resources for women may also decrease their vulnerability to food insecurity and increase their expenditures on nutritious food.

Building on 50 years of CGIAR research and innovation, the AICCRA project aims to scale-up proven CSA options and climate services to reach millions of smallholder farmers in Africa. AICCRA works with partners at national and regional levels throughout the continent. The project operates in six countries across two regions: East and Southern Africa (Ethiopia, Kenya, and Zambia) and West Africa (Senegal, Ghana, and Mali). After nearly three years of implementation in the three AICCRA-anchored countries in West Africa, AICCRA has generated research outputs that serve as evidence of successfully inducing gender and nutrition outcomes for climate-smart agriculture (CSA) and climate information services (CIS) (Gondwe et al., 2022; Huyer & Chanana, 2021; Partey et al., 2020).

Through collaborative efforts and engagement with the West and Central African Council for Agricultural Research (CORAF), the AICCRA West Africa cluster is working to scaling up gender-and nutrition-sensitive technologies in West and Central Africa. From 12 to 15 September 2023, its partner, the CORAF organized the Market for Agricultural Innovation and Technology (MITA) Forum in Ouagadougou, Burkina-Faso.

The MITA aims to accelerate the adoption and use of the best agricultural technologies and innovations to transform African agriculture. During the MITA, AICCRA West Africa (WA) collaborated with country and thematic clusters and regional partners (CORAF, AGRHYMET, and WASCAL/RUFORUM) to hold a side event aimed at promoting the latest AICCRA gender and nutrition-sensitive CSA and CIS innovations from WA countries. Also, to identify spillover mechanisms through sub-regional organizations to support the scaling up of science-based gender and nutrition-sensitive CSA and CIS options.

METHODOLOGY

The event was structured in two main phases. The initial phase involved an introductory presentation of AICCRA's strategy and experience in scaling up gender- and nutrition-sensitive CSA and CIS, followed by presentations of potential gender- and nutrition-sensitive CSA and CIS innovations available for scaling up by each of AICCRA's clusters focusing on dry land cereals and livestock in Senegal, rice-based systems in Mali and roots and tubers in Ghana (Table 1). The second phase involved a panel discussion with sub-regional organizations on leveraging their initiatives at the regional level to create a ripple effect across West and Central Africa. A questionnaire was administered to participants at the end of the event to document participants' learning outcomes, key gender- and nutrition-sensitive climate-smart agriculture technologies of interest to them, and post-event scaling actions.

Table 1: Gender and Nutrition Sensitive Technologies presented by AICCRA anchored countries

Countries	Gender and Nutrition sensitive technologies	Description
Ghana	Biopesticides- Neem leaf	Neem leaf extract (essential oil) can be used as a biopesticide to treat soil borne diseases. It is bundled with CSA-CIS and can be applied to cowpea, sweet potatoes, vegetables, and yams. This product is targeted at female farmers who are the main producers of cowpea and potatoes. Low-cost option for pesticide use on cowpea and sweet potato crops, which are primarily farmed by women. This option decreases production expenses. It also improves food safety and promotes the production of cowpea and sweet potato for their nutritional benefits.
	Smart Maize Seeds	Smart maize seeds bundled with the CSA-CIS. They grow in all agro-ecological zones suitable for maize cultivation, and are intended for farmers and agro-processors. The seeds are biofortified with provitamin A. Its use in maize-based foods helps combat malnutrition in children under 5, pregnant women and nursing mothers.
	Dual Purpose Cowpea	Dual purpose cowpea for grain and fodder; bundled with CSA-CIS. It can be grown in all agro-ecological zones and aimed at women who are engaged in both crop and livestock farming. Women can increase their earnings by combining crop and livestock farming. Both cowpea and livestock are important sources of protein for households.
Mali	GEM Parboiler	Traditional parboiling is a laborious, time-consuming process that produces impurities, broken grains, and undesirable odors with requirement of lot of firewood and water. The GEM improves the physical and nutritional quality of rice. It's suitable for all types of rice environments. Specific target: Women dominating the small-medium scale rice parboiling industry in Africa.

	Integrated Rice-Fishery production system	The integrated Rice-Fishery consists in co-cultivation of rice and fish for reduced use of chemical inputs, and enhanced income, food and nutrition. It can be practiced in lowlands where water is available for at least 6 months. Target groups include farmers and private organization.
	Pay-as-you go solar powered irrigation	This is a business model enabling farmers to pay for solar-powered irrigation system as they can afford it. The technology is suitable for irrigated and rainfed lowlands, targeting farmers with low income (most women) who cannot access solar irrigation and produce crops in water-scarce areas.
	Rice Advice	Android-based app that provides farm-specific advice on rice management practices. Adapted to irrigated and rainfed lowlands. The technology has demonstrated impact with increased rice yield by 0.8 t/ha with more increase in women than men's fields; increased farmers' income by 360 – 380 USD/ha
	Smart Valleys	Low-cost, and bottom-up approach for water control in inland valleys. Application domains are rainfed lowlands or Inland valleys. Technology is proven to increased yield by 1.7 – 2.6 t/ha with higher increase in drought-prone fields; most used by women; as well as to increase income by 218 – 1157 USD/ha and food consumption score by 3 – 9
	Drought and submergence tolerant varieties	Drought (NERICA4, ARICA18, KAFACI1) and submergence tolerant varieties (NERICA L-19 sub1, and WITA-4 sub1). Technology is proven to increase rice yield by 0.7 – 2.0 t/ha and farmers' income by 172 – 627 USD/ha, as well as food consumption score by 1 – 5.
	Mechanical transplanter / direct seeder	Application domains are irrigated, rainfed lowlands and rainfed uplands. Ensure timely crop establishment, and reduce labour requirement by women.
Senegal	The Gender Smart Accelerator Challenge	A means of imparting business skills, training, and increased access to finance among women owned or women dominated agro-enterprises. Applicable to all agro-ecological zones and value chains, targeting women agro-entrepreneurs. The innovation contributed to improving profitability of women agri-SMEs in addition to job creation and income increases.
	Climate-Informed Advisory Service for diary sector	The technology involves providing Pastoralist and Agropastoralists communities with tailored climate information services.
	Nutritional Package from dairy sector	The technology involves the formulation of rations: groundnut tops and cakes, panicum, Maral alfa, luzerne added with 58-74 cowpea. Additionally, yogurt made from the milk of goat. The technology is proven to contribute to addressing malnutrition in infants, as well as providing fodder resources for livestock

KEY FINDINGS AND DISCUSSIONS

COUNTRIES AND PARTICIPANTS PROFILES

49 respondents from 14 countries participated in the event. The countries represented were Benin, Burkina-Faso, Cameroon, Ivory Coast, Ghana, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, Chad, Gambia, and Togo. National Agricultural Research System was the most represented among different stakeholders, accounting for 37%. National and regional projects and programs were also represented, accounting for 20%. Government entities, represented by delegates from the Ministries of Agriculture and Directories, made up 10%. Academia, Intergovernmental entities, International Research Organizations, and Civil societies were less represented.

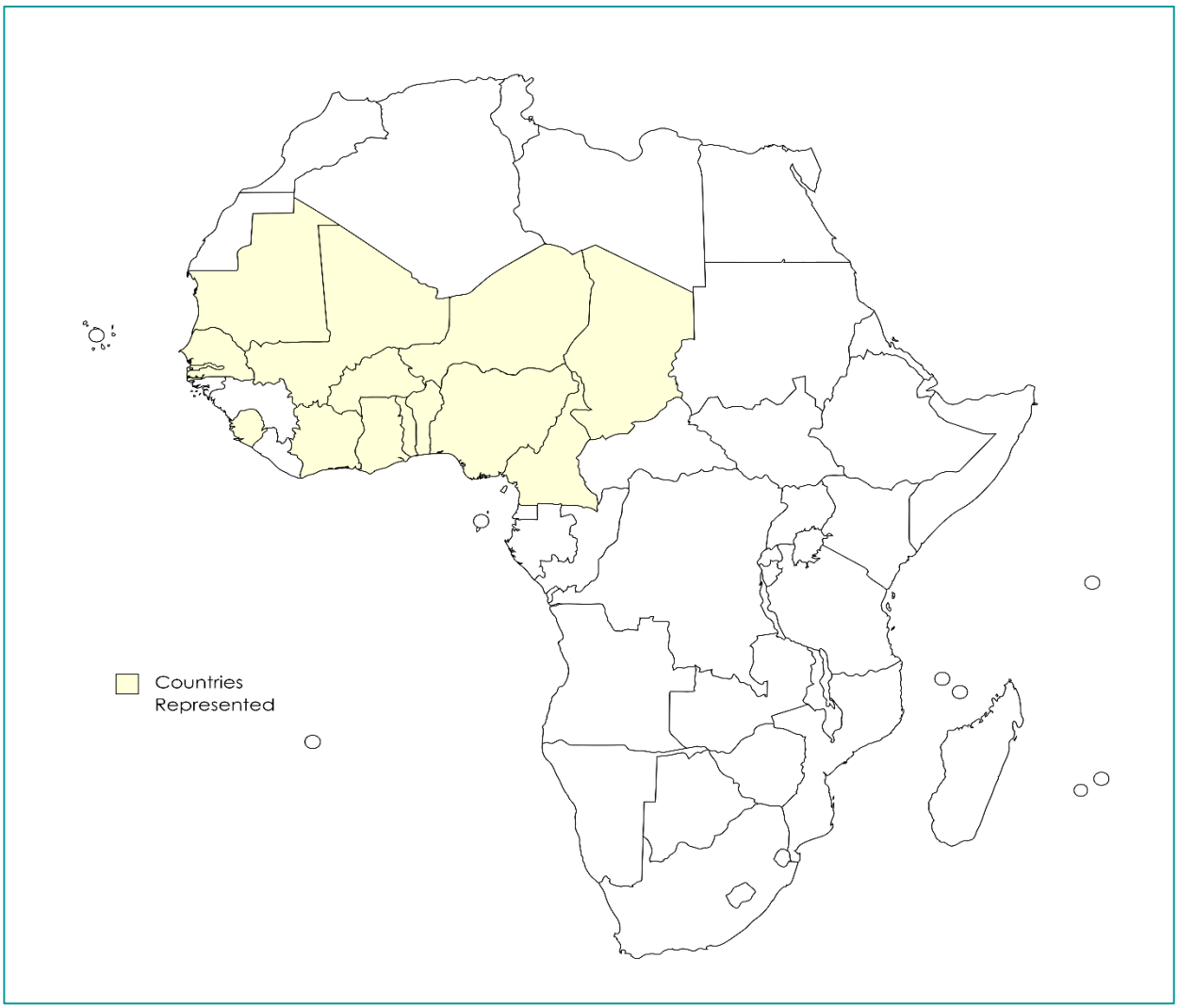

Figure 1: Countries represented during the event

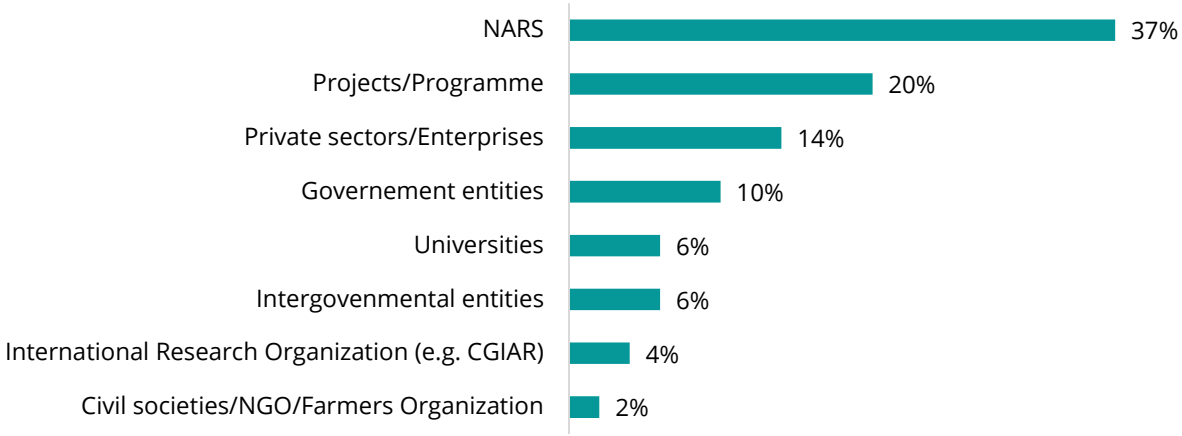

Figure 2: Institution represented during the event

LEARNING OUTCOMES OF THE EVENT

Though most of the participants had some prior knowledge of CSA technologies and practices (88%), the AICCRA event at MITA yielded two major learning outcomes (Figure 3). First, participants gained and deepened their understanding of climate-smart agriculture and related technologies, their importance and potential in the context of climate change. Secondly, participants gained awareness of gender in agriculture, gender- and nutrition-sensitive CSA technologies, and their ability to strengthen agricultural sustainability and women's empowerment in African nations.

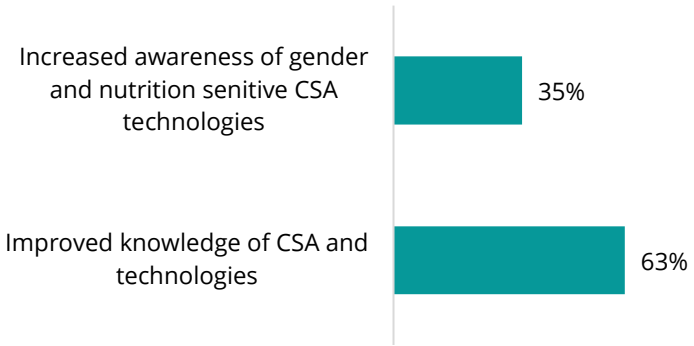

Figure 3: Learning outcomes

TECHNOLOGIES OF INTEREST TO PARTICIPANTS

Participants at the event expressed their interest in gender and nutrition-sensitive (GNS) technologies. We found that the most preferred GNS technologies (45% of respondents) were the "Pay-as-you-go solar powered irrigation business models", which allows farmers to pay for the solar irrigation system in instalments, with each payment contributing to the total purchase price of the system; and the "Integrated Rice-Fishery Production System", where farmers can co-produce rice and fish in the same field. These two technologies are effective in reducing gender inequalities related to accessing and controlling productive resources.

They also improve household food and nutrition security (Dossou-Yovo, 2023; Dossou-Yovo et al., 2021).

The third most interested technology was smart maize seeds (39%). About 24% of the participants are interested in the Nutritional Package from the dairy sector. Other interesting technologies included the GEM rice parboiling method and the use of biopesticides, specifically Neem leaf extract, to treat diseases in soil.

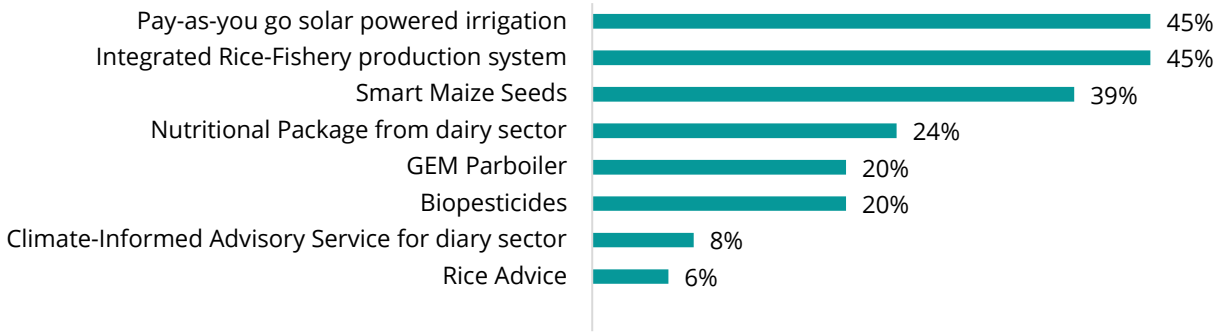

Figure 4: GNS technologies of interests to participants

TOWARD SCALING GENDER AND NUTRITION SENSITIVE TECHNOLOGIES

Participants gained valuable knowledge during the event and made commitments to promote gender and nutrition sensitive innovation. A significant number (51%) of participants intend to create awareness and disseminate gender and nutrition sensitive CSA and CIS through various events including seminars, workshops, conferences to different stakeholders including local farmers, processors, seed producers, communities, women cooperative groups, projects, etc. This further shows that the technologies presented at the event were relevant to the majority of the participants. Around 31% of the participants will share and report the knowledge gained with colleagues at their respective institutions.

Additionally, 24% of the participants committed to test the feasibility of the technologies and later use CSA technologies that are relevant to them. Examples of such technologies include the smart maize seed, neem leaf extract, and the rice-fishery integrated production. Besides, 18% of the participants who are now gender aware have decided to start mainstreaming gender and nutrition perspectives in research and development projects and ongoing interventions as well as in the field while working with farmers. This is significant step towards reducing gender inequalities and empowering women.

Meanwhile, 10% of the participants with ongoing CSA interventions within their national institutions intend to accelerate the scaling up of GNS technologies. Very few participants intended to design or redesign projects to promote GNS technologies.

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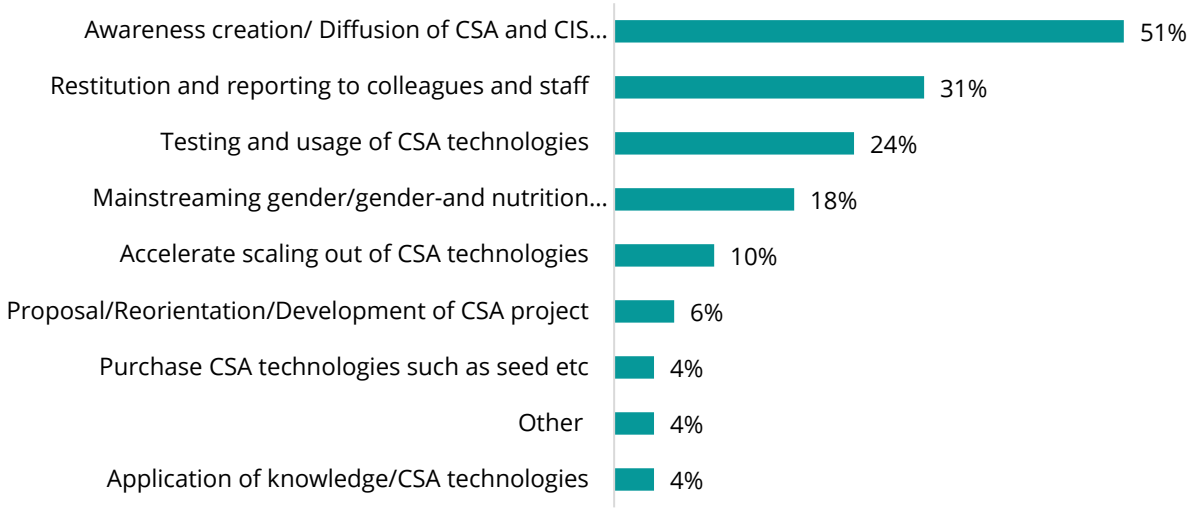

Figure 5: Next Steps towards scaling GNS technologies

LESSONS LEARNT AND WAY FORWARD

Awareness of gender- and nutrition-sensitive CSA technologies and CIS increased as a result of the Market for Agricultural Innovation and Technology event. While awareness-raising is the first step in promoting behavior change, there is a need to accelerate efforts towards effective implementation and adoption of gender and nutrition-sensitive CSA technologies. Achieving this will require addressing the root causes of gender inequality at all levels, and gender transformative approaches to the design and implementation of CSA interventions provide an opportunity. Further, interventions to promote existing gender and nutrition-sensitive CSA technologies need to be accompanied by actions to reduce gaps in access to and control over productive resources (land, extension and information services, finance, information and communication technologies (ICTs), and labor). Additionally, it's crucial to support gender responsive monitoring and evaluation of CSA interventions across all levels, tracking gender outcomes, ensuring that the distinct priorities and needs of both women and men are considered, and assessing their impacts on gender equality and the empowerment of women.

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To cite this Info Note
Segnon, A.C., Obossou, E., Moustapha, B.Y., Ganyo, K.K., Kpadonou, G.E., Lamien, N., Zougmoré, R.B. 2023. Scaling Gender and Nutrition Sensitive technologies and innovations in West and Central Africa: Lessons learnt from the Market for Agricultural Innovation and Technology. AICCRA Info Note. Accelerating Impacts of CGIAR Climate Research for Africa (AICCRA)

Acknowledgements
Accelerating Impacts of CGIAR Climate Research for Africa (AICCRA) is a project that helps deliver a climate-smart African future driven by science and innovation in agriculture. It is led by the Alliance of Bioversity International and CIAT and supported by a grant from the International Development Association (IDA) of the World Bank.

About AICCRA Info Notes
Titles in this series aim to disseminate interim research on the scaling of climate services and climate-smart agriculture in Africa, in order to stimulate feedback from the scientific community.

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Accelerating Impacts of CGIAR Climate Research for Africa (AICCRA) is a project that helps deliver a climate-smart African future driven by science and innovation in agriculture. It is led by the Alliance of Bioversity International and CIAT and supported by a grant from the International Development Association (IDA) of the World Bank. Explore our work at aiccra.cgiar.org

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