

Scaling Climate-Smart Agriculture technologies and innovations in West and Central Africa through regional spillover mechanisms

Experiences from CORAF and way forward

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Key messages

- Scaling Climate-Smart Agriculture (CSA) technologies and innovations is essential to address climate change impacts in agriculture and food systems in West Africa.
- Through engagement with existing regional institutions such as CORAF, AICCRA piloted innovative approaches to scaling up CSA technologies and innovations in West Africa, including innovation pitching, business-to-business (B2B) talk, and regional consultation workshops.
- CSA innovation pitches and B2B approaches have created awareness and resulted in a high level of interest in CSA technologies beyond AICCRA anchored countries.
- Regional engagement and consultation has led to the adoption of CSA institutional innovations in Central Africa. The regional Science-Policy dialogue platform, an institutional innovation for mainstreaming CSA into agricultural development plans and investments, is formalized in the Central African region based on the experience of West African Alliance for CSA and the national science-policy dialogue platforms in West Africa.
- Regional Science-Policy dialogue platforms are potential channels through which regional organizations can express their demands for CSA technologies in different countries.
- As CSA technologies are increasingly reaching more countries, there is a further need to monitor the extent to which the intentions and interests are translated into concrete actions at national and regional level.



Background

Climate change remains a major threat to agriculture and food systems in West Africa, resulting in reduced crop productivity and incomes, increased livestock mortality and price shocks, reduced availability of fodder and pasture, and reduced fisheries catches and livelihoods (Carr et al., 2022; Trisos et al., 2022). Addressing these challenges will require a large-scale expansion of climate resilient approaches in agriculture and food systems. Climate-Smart Agriculture (CSA) holds the promise of optimizing food system sustainability by improving agricultural productivity, increasing adaptation, and reducing carbon footprints (Lipper et al., 2014; Totin et al., 2018). Despite multiple interventions in recent years to promote CSA, the adoption of CSA technologies remains low in West Africa (Partey et al., 2018). The low uptake of CSA technologies calls for concerted efforts and innovations to effectively scale up CSA technologies.

Building on 50 years of CGIAR research and innovation, the Accelerating Impacts of CGIAR Climate Research for Africa (AICCRA) project has been working with various partners at national

and regional level across Africa to scale up proven CSA options to reach millions of smallholder farmers in Africa. AICCRA works in six countries in two regions: East and Southern Africa (Ethiopia, Kenya and Zambia) and West Africa (Senegal, Ghana, and Mali). Through collaboration and engagement with the West and Central African Council for Agricultural Research (CORAF), AICCRA West Africa cluster has been working to scale up CSA technologies in West and Central Africa. The purpose of this Info Note is to provide a synthesis of AICCRA engagement to scaling-up CSA beyond AICCRA-anchored countries through CORAF-led spillover events.

By scaling up CSA, we mean packaging and widely dissemination of evidenced CSA practices, technologies and institutional options to influence large-scale (e.g. national, regional) investment plans, mainstreaming institutional changes, and/or informing policies (Aggarwal et al., 2018; Kpadonou et al., 2022). One of the main conditions for successful scaling up of CSA, and also an integral part of the AICCRA strategy, is the building of appropriate partnerships with various regional organizations for sustainable implementation of specific theory of change for scaling (Campbell et al., 2023; Sseguya et al., 2022). These partnerships can be formal or informal, but they fundamentally involve an agreement between the partners to work together towards a common goal, and through specific pathways with each partner mobilizing and contributing complementary resources (Campbell et al., 2023).

We present three cases of CORAF-led events where CSA technologies and innovations have been promoted for large-scale dissemination and uptake. We used data collected during the three events to illustrate how AICCRA engagement has contributed to disseminating CSA technologies and innovations across countries and regions. Each event brought together various stakeholders with different profiles from different countries in West and Central Africa. Data were collected through a short survey administered to participants after they were exposed to the events. Their intentions and how they intent to use the new knowledge gained from the events were also assessed.

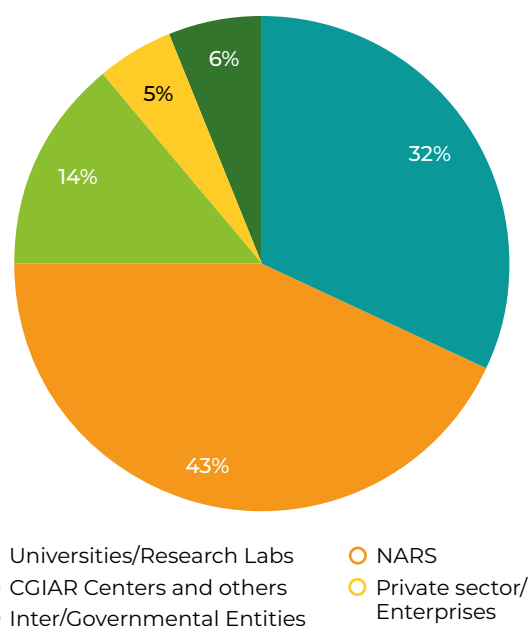


Case 1: Using business pitching to scale up CSA innovations

In collaboration with country clusters (Ghana, Mali and Senegal), AICCRA West Africa cluster organized a side event during the Symposium on the State of Agricultural Research in West and Central Africa organized by CORAF. The symposium was held in Cotonou from July 19 to 21, 2022 and brought together 107 participants from 19 CORAF member countries (Benin, Chad, Burkina-Faso, Niger, Cameroon, Nigeria, Mali, Togo, Côte d'Ivoire, Senegal, Mauritania, Guinea-Conakry, Guinea-Bissau, Ghana, Gambia, Gabon, Congo) with a strong representation (43%) of National Agricultural Research Institutes (NARS). Other participants represented universities and research laboratories, the private sector and civil society, CGIAR Centres, and Intergovernmental agencies (Figure 1).

The side event was organized to showcase the achievements and lessons learned in scaling up proven CSA and climate information services in AICCRA-anchored countries in West Africa. The objective was to share knowledge and information on technologies and practices that have been

FIGURE 1: Categories of participants in the side event at the CORAF Symposium in Cotonou, Benin



demonstrated as feasible and effective CSA options for various agricultural value chains in West Africa, focusing on dry land cereals and livestock in Senegal, rice-based systems in Mali and roots and tubers in Ghana. To achieve this,

TABLE 1: Potential CSA options for scaling AICCRA-anchored countries

Countries	CSA Innovation	Description
Ghana	Improved seeds	Stress tolerant crop varieties (drought tolerant, early maturing, striga tolerant, pest and disease tolerance, and low N tolerance)
	Enhanced biopesticide and biocontrol use	Biological soil and seed treatment (neem extract); Phytoseids to control red spider mites; <i>Beauveria bassiana</i> to control
	Enhanced organic fertilizer use	BSF technology for organic waste and Farmyard Manure Management
Mali	Rice Advice	Android-based app that provides farm-specific advice on rice management practices
	Smart Valleys	Low-cost, and bottom-up approach for water control in inland valleys
	Gem Parboiler	Improved rice parboiling technique which produces rice of high physical and nutritional quality
	A DSS for rice-based system development and ecosystem services preservation in lowlands	Automated approach for mapping inland valleys with their suitability for rice-based systems development
Senegal	Drought and submergence tolerant rice varieties	NERICA L-19 sub1, and WITA-4 sub1, tolerant to submergence for 7 weeks. NERICA4 and ARICA18 tolerant to drought
	Improved management of livestock in the dry season	Formulating feed from locally available harvest residues and grazing to improve meat (sheep and cattle) and milk (cattle) production
	Integrating CSA and CIS	CSA packages deployed supported with seasonal yield forecasting: Examples include combining pearl millet and groundnut cultivars with ISFM approach; Technology parks to promote adapted improved varieties of millet, groundnut, and cowpea compared to local variety as well as different production techniques
	Ag-Data-Hub	Platform to integrate climate data into agriculture decision-making
	Intelligent Agricultural Systems Advisory Tool (ISAT)	Dissemination of site-specific weekly agro-advisory (late June - Sept) based on the seasonal and in-season rainfall forecast

FIGURE 2: Knowledge gained by participants after being exposed to the side event

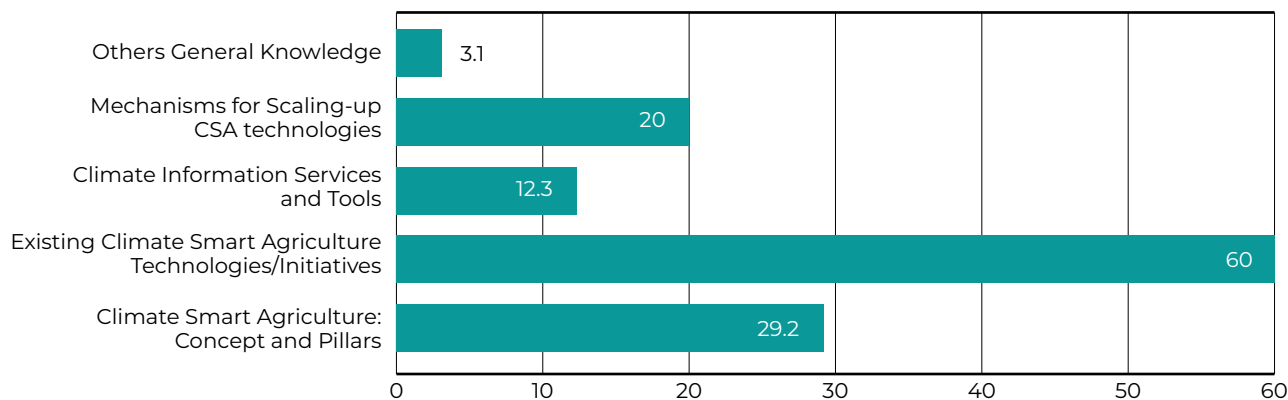
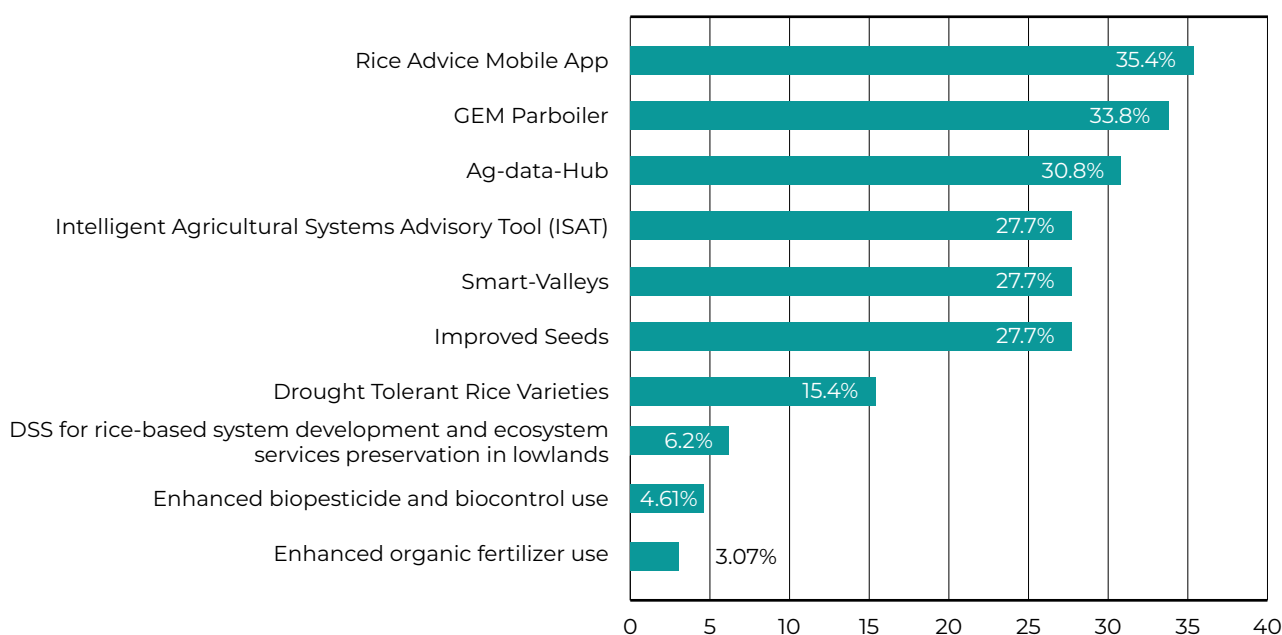


FIGURE 3: Participants' interests to CSA technologies and innovations presented



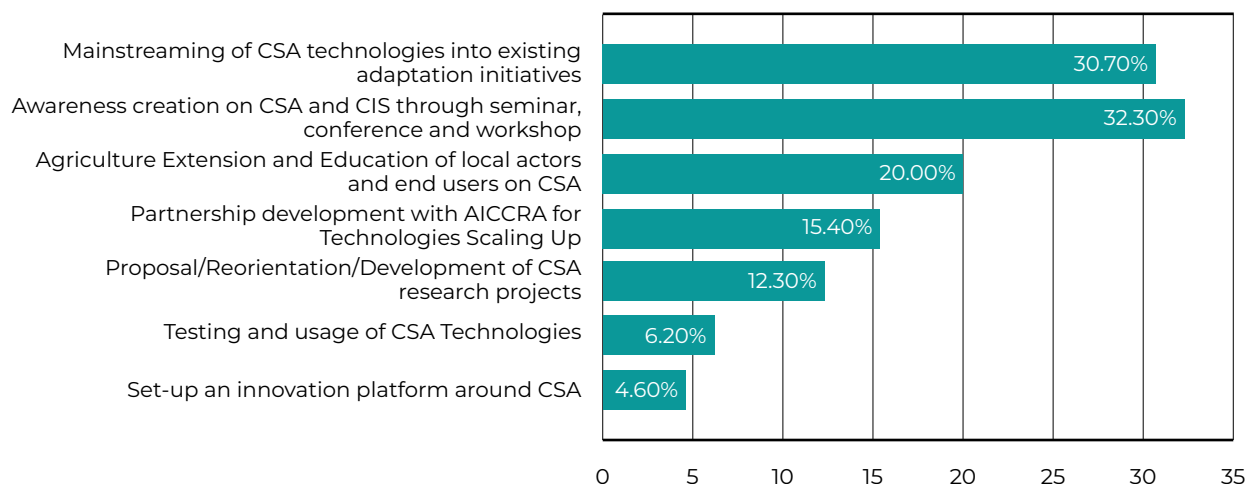
AICCRA WA organized three CSA innovation pitches specific to AICCRA-anchored countries and a panel discussion with the three regional institutions (AGRHYMET, CORAF and WASCAL). Each pitch provided an overview of a range of proven technologies and innovations for scaling and the benefits (Table 1).

Three key outcomes resulted from CSA innovation pitches. First, CSA Innovation Pitching has provided participants with a good understanding and knowledge of existing CSA technologies and initiatives (60%), CSA concept (29.2%), mechanisms for scaling-up CSA technologies (20%) and the existing Climate Information Services and Tools (12.3%) (Figure 2).

The second outcome relates to the interest and intentions of participants to scale up CSA technologies. CSA technologies and innovations which received the high interests included Rice Advice (35.4%), GEM Parboiler (33.8%), Ag-data-Hub (30.8%), the Intelligent Agricultural Systems Advisory Tool (27.7%), the Smart Valley (27.7%), improved seeds (27.7%), drought tolerant rice varieties (15.4%) (Figure 3).

The third outcome of the side event is related to the steps participants will take to translate their intentions to scale up CSA technologies into concrete actions. Overall, 30.70% of the participants committed to mainstreaming the new knowledge gained on CSA concept, technologies and

FIGURE 4: Scaling actions proposed by participants



innovations into local/country adaptation initiatives (Figure 4). Over 32.30% of the participants plan to carry out awareness creation activities to introduce CSA technologies and CIS to a wide range of stakeholders. At the same time, 20% of the stakeholders plan to design and implement an extension education program on CSA targeting end-users. Moreover, 15.40% intent to partner with AICCRA to receive support for scaling up CSA technologies within their institution and country.

Case 2: Scaling CSA Innovations through B2B marketing

The Market for Agricultural Innovation and Technology (MITA) event was held in Dakar from 02-05 November 2022 with the purpose of support the promotion of access and scaling up of agricultural technologies and innovations in West and Central Africa. The event brought together 188 participants of diverse profiles including researchers, academics, extension, technology developers, enterprise and private sectors. During the event, AICCRA, through the West Africa cluster, as a CSA innovation and technologies provider had opportunity to market CSA technologies and innovations to increase buy in through a “business to business” (B2B) marketing. This has involved at the first stage the sensitization and the awareness creation on CSA technologies. The CSA technologies presented by AICCRA included: Climate-smart

villages approach, GEM Parboiler, Improved Crop varieties. The buy-in session consisted of bilateral (B2B) discussions between AICCRA and potential buyers to enable the latter to select the technologies and innovations they intend to purchase.

Overall, the B2B discussions allowed AICCRA to potentially sell three of its CSA innovations (Climate-Smart Village approach, GEM Parboiler and Improved Cowpea varieties) to four countries including The Gambia, Burkina Faso, Central African Republic, and Cameroon.

Case 3: Scaling up institutional CSA innovation through a regional consultation workshop: Regional science-policy dialogue platform to drive scaling

This section highlights the potential role of science-policy dialogue in supporting the scaling up of CSA technologies beyond AICCRA countries. As part of the support to regional agricultural policies in West and Central Africa, CORAF organized from 29 to 31 March 2022 (in Lomé, Togo) a regional consultation workshop to launch the Alliance for CSA in Central Africa, a regional Science-Policy-Dialogue Platform, which is an institutional CSA innovation for mainstreaming evidence-based CSA knowledge into agricultural development programs and policies as well as coordinating demands for CSA

technologies to be scaled up. The workshop, held in a hybrid format, and brought together 79 stakeholders (Table 2).

The regional workshop was an opportunity to revitalize the West Africa Alliance for CSA (WACSAA¹). The WACSAA which was set up in June 2015 with 17 member countries and supported by CCAFS and later by AICCRA aims to promote capacity development and awareness of CSA technologies

and innovations in West Africa. Capitalizing on the experience of WACSAA through AICCRA, the workshop has resulted in the establishment of an Alliance for CSA in Central Africa. The workshop has further enabled AICCRA to identify appropriate CSA technologies in response to the demands of the two regional CSA alliances (West Africa and Central Africa) that will be scaled up through a policy dialogue platform. The technologies identified are summarized in the Table 3.

TABLE 2: Regional Workshop participants

No	Categories	Stakeholders list
1	National and Regional authorities	ECOWAS, UEMOA, ECCAS, CEMAC, CILSS
2	Financial Partners	EU, IFAD, EBID, BOAD, ADB, USAID, AFD, SDC
3	Technical partners	CNS/CRS/CE FAO, IITA, ICRISAT, AICCRA, WAVE, BIMAF, CSAO
4	Civil society	AFAO, WILDAF, OXFAM
5	Operational Partners	CSA Alliances, UNFCCC Focal Points, CAADP-XP Project Focal Points, NIPSAN/PDAA teams and the RPOs (ROPPA, PROPAC, RBM, APSS, CORET, PANEPAO)

TABLE 3: Knowledge and Technologies Identified for each region

West Africa Region	Central Africa Region
<ul style="list-style-type: none"> • Adjusting agro-sylvo-pastoral and fisheries calendars • Good agricultural practices • Sustainable land management • High-yielding varieties adapted to drought, warming and pest pressure (excluding GMOs and hybrids) • Water conservation measures for food production 	<ul style="list-style-type: none"> • Biodiversity conservation options • Soil rehabilitation • Agroforestry/Reforestation • Cropping calendar adjustment • High-yielding varieties • Improved pasture management

CONCLUDING REMARKS

The development of a strategy for scaling up research results is essential to make a significant contribution to increasing sustainable agricultural productivity, improving food security and reducing poverty. The three case studies of CORAF-led events provided evidence of the potential spillover mechanisms of CSA technologies beyond AICCRA-anchored countries.

Scaling up strategies that have contributed to this change include innovation pitching, business to business (B2B) through the regional market, and a regional consultation that led to the establishment of a regional Alliance for CSA in Central Africa. Such actions should be continued by AICCRA and its partner organizations in order to increase the spillover effects.

Moreover, as CSA technologies and innovations are increasingly reaching more countries, it is important to monitor the extent to which the behavioral change expressed by users' (e.g., intentions and interests) in CSA technologies are translated into concrete actions and adoption at the country and regional level. Outreach and innovation support efforts are also needed to increase interest in CSA technologies, especially those that are little sought after despite their transformative potential. Participatory approaches to identifying barriers to innovation across the context are also necessary to provide adequate support for greater impact.

LIST OF ACRONYMS

ADB	African Development Bank	IFAD	International Funds for Agricultural Development
AFAO	Australian Federation of AIDS Organisations	NIPSAN	National Program for Agricultural Investment and Food and Nutritional Security
AFD	French Development Agency	PANEPAO	Regional platform of non-state actors in fisheries and aquaculture in West Africa
APES	Association for the Promotion of Livestock in the Sahel and Savannah	PDDAA	Comprehensive Africa Agriculture Development Program
BOAD	West African Development Bank	PROPAC	Regional Platform of Peasant Organizations of Central Africa
CAADP-XP	The Comprehensive Africa Agriculture Development Programme ex-Pillar 4	ROPFA	Network of Farmers' and Producers' Organizations of West Africa
CEMAC	Economic and Monetary Community of Central Africa	SDC	Swiss Agency for Development and Cooperation
CILSS	Permanent Interstate Committee for drought control in the Sahel	UEMOA	West African Economic and Monetary Union
CORET	Confederation of Traditional Livestock Organizations in Africa	UNFCCC	United Nations Framework Convention on Climate Change
CSAO	Sahel and West Africa Club	USAID	United States Agency for International Development
EBID	ECOWAS Bank for Investment and Development	WILDAF	Women in Law and Development in Africa
ECCAS	Economic Community of Central African States		
ECOWAS	Economic Community of West African States		
EU	European Union		

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¹ <https://www.fao.org/3/bl860e/bl860e.pdf>

About this AICCRA INFONOTE

This Infonote is an output of the collaborative partnership between AICCRA West Africa cluster and CORAF, an association of national agricultural research systems in 23 West and Central Africa countries. It has also received contributions from country clusters (Ghana, Mali, and Senegal). List of authors: *Alcade Segnon*, West Africa Science Officer (AICCRA). *Esdras Obossou*, Consultant for AICCRA WA. *Niéyidouba Lamien*, Programmes Manager and Focal Point, Agriculture, Food and Nutrition Security PID (CORAF) and AICCRA Focal Point. *Robert Zougmore*, West Africa Leader (AICCRA).

About AICCRA

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