




# CGIAR Research Initiative on **West and Central African Food Systems Transformation**

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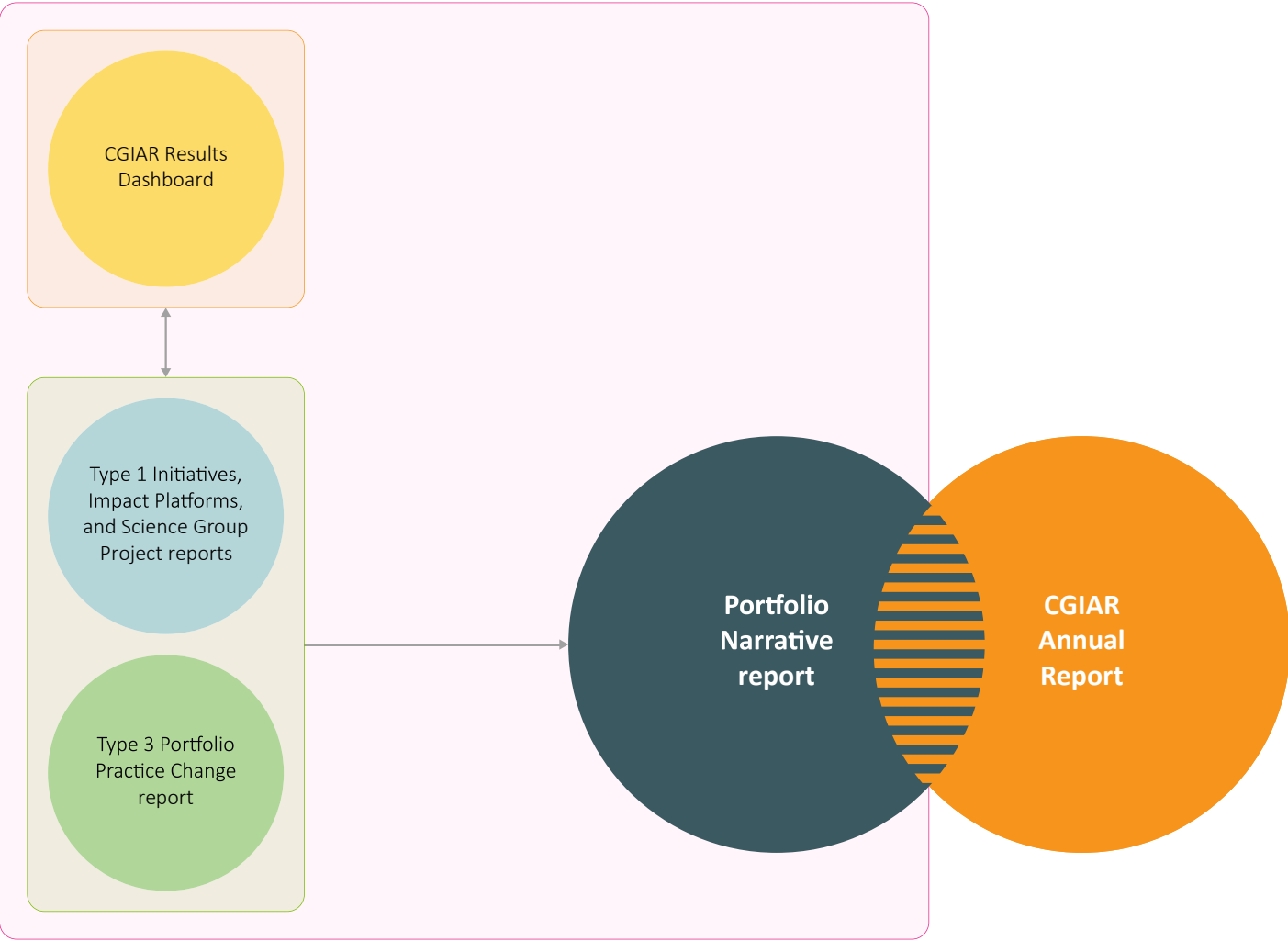
CGIAR Technical Reporting 2023

CGIAR Technical Reporting has been developed in alignment with the [CGIAR Technical Reporting Arrangement](#). This Initiative report (“Type 1” report) constitutes part of the broader [CGIAR Technical Report](#). Each CGIAR Research Initiative submits an annual “Type 1” report, which provides assurance on Initiative-level progress towards End of Initiative outcomes.

The [CGIAR Technical Report](#) comprises:

- Type 1 Initiative, Impact Platform, and Science Group Project (SGP) reports, with quality assured results reported by Initiatives, Platforms and SGPs available on the CGIAR Results Dashboard.
- The Type 3 Portfolio Performance and Project Coordination Practice Change report, which focuses on internal practice change.
- The Portfolio Narrative, which draws on the Type 1 and Type 3 reports, and the CGIAR Results Dashboard, to provide a broader view on Portfolio coherence, including results, partnerships, country and regional engagement, and synergies among the Portfolio’s constituent parts.

The CGIAR Annual Report is a comprehensive overview of CGIAR’s collective achievements, impact and strategic outlook, which draws significantly from the Technical Report products above. For 2023, the Annual Report and Technical Report will be presented online as an integrated product.





Section 1: Fact sheet and budget

Initiative name	Transforming Agrifood Systems in West and Central Africa
Initiative short name	West and Central African Food Systems Transformation
Initiative Lead	Aminou Arouna ( <a href="mailto:a.arouna@cgiar.org">a.arouna@cgiar.org</a> )
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Science Group	Resilient Agrifood Systems
Start – end date	01/04/2022 – 31/12/2024
Geographic scope	<b>Regions</b> West Africa · Central Africa  <b>Countries</b> Burundi · Côte d’Ivoire · Ghana · Nigeria · Rwanda · The Democratic Republic of the Congo
OECD DAC Climate marker adaptation score <sup>1</sup>	<b>Score 1: Significant</b> The activity contributes in a significant way to any of the three CGIAR climate-related strategy objectives—namely, climate mitigation, climate adaptation and climate policy—even though it is not the principal focus of the activity.
OECD DAC Climate marker mitigation score <sup>1</sup>	<b>Score 2: Not targeted</b> The activity does not target the climate mitigation, adaptation, or climate policy objectives of CGIAR as put forward in its strategy.
OECD DAC Gender equity marker score <sup>2</sup>	<b>Score 1A: Gender accommodative/aware</b> Gender equality is an objective, but not the main one. The Initiative/project includes at least two explicit gender-specific outputs and (adequate) funding and resources are available. Data and indicators are disaggregated by gender and analyzed to explain potential gender variations and inequalities.
Website link	<a href="https://www.cgiar.org/initiative/22-market-driven-resilient-and-nutritious-agrifood-systems-in-the-humid-zones-of-west-and-central-africa/">https://www.cgiar.org/initiative/22-market-driven-resilient-and-nutritious-agrifood-systems-in-the-humid-zones-of-west-and-central-africa/</a>

<sup>1</sup> The Organisation for Economic Co-operation and Development (OECD) Development Assistance Committee (DAC) markers refer to the OECD DAC [Rio Markers for Climate](#) and the [gender equality policy marker](#). For climate adaptation and mitigation, scores are: 0 = Not targeted; 1 = Significant; and 2 = Principal.

<sup>2</sup> The CGIAR Gender Impact Platform has adapted the OECD gender marker, splitting the 1 score into 1A and 1B. For gender equality, scores are: 0 = Not targeted; 1A = Gender accommodative/aware; 1B = Gender responsive; and 2 = Principal.

These scores are derived from [Initiative proposals](#), and refer to the score given to the Initiative overall based on their proposal.

EXECUTIVE SUMMARY

Following its 2022 activities, the CGIAR Research Initiative on West and Central African Food Systems Transformation has been instrumental in establishing a strong foundation for evidence-based impact through [baseline](#) surveys and [e-registration](#) of value chain actors, which were completed in its six target countries. In total 22,701 value chain actors were e-registered as future potential beneficiaries. Data were collected on the Women’s Empowerment in Agriculture Index (WEAI) and on social constraints to gender and generational equality to design strategies for social inclusion in agrifood systems in West and Central Africa.

Different reports were completed, including on understanding of rice farming practices in [Burundi](#), Democratic Republic of the [Congo](#) (DRC), and [Rwanda](#); cocoa [rehabilitation](#) in Ghana; modeling of future water scenarios for cocoa farming in Côte d’Ivoire and Ghana; [diversification](#) of rice production systems in Côte d’Ivoire and Nigeria; mapping of climate and agronomic digital advisory services landscape; and enhancement of flood early warning systems (EWS) in Nigeria and Rwanda.

The Initiative has reported 17 climate-smart innovations, of which 8 are under uncontrolled testing and will be ready from 2024 to be scaled for impact. The scaling readiness of four innovations has increased between 2022 and 2023. Institutions for scaling and co-development were also facilitated, including two women and youth agribusiness hubs installed in Côte d’Ivoire and Ghana, and an [agro-advisory committee](#) established in Rwanda to scale the EWS for fall armyworm (FAW). To increase scaling readiness of the innovations, investment action plans were developed for eight innovations.

Through its results-based approach, the Initiative is already benefiting small-scale value chain actors, including youth and women. For instance, the EWSs were disseminated to 51,044 individuals, and 100 smallholders have accessed genetically improved farmed tilapia (GIFT) as a nutrient-dense food in Nigeria.

The on-the-ground impacts of the Initiative are already visible. We assessed effects on the livelihoods of women from the improved rice parboiling system called “grain quality enhancer, energy-efficient, and durable material” (GEM), which was promoted by the Initiative through capacity building and market linkages in the women and youth innovation platform. Evidence shows that the GEM parboiling system allows women to gain an additional 140 kg of milled rice per tonne of paddy and US\$73 of additional income. Adoption of GEM has reduced the poverty rate by 26 percent among households that adopted the system, and GEM is benefiting women in 11 countries in Africa.

To build human capacity, the Initiative conducted about 35 capacity sharing events, which reached 2,342 beneficiaries, including 518 women (22 percent). Strategic capacity-sharing events led to six processors being trained on vitamin A-rich orange-fleshed sweet potato puree as a partial substitute for wheat flour in baked products to improve nutrition, 90 processors and feed millers trained on the use of the wet hammer mill and processing of cassava peels for value addition, 20 youth and women trained on entrepreneurship and business development skills, and 197 participants trained in seed supply and outgrowing of GIFT. The Initiative’s results have contributed to all of CGIAR’s five Impact Areas and 10 SDGs.

	2022	2023	2024
PROPOSAL BUDGET	\$6.33M	\$12.40M	\$11.27M
APPROVED BUDGET <sup>1</sup>	\$4.14M	\$4.56M <sup>2</sup>	\$3.99M <sup>3</sup>

<sup>1</sup> The approved budget amounts correspond to the figures available for public access through the [Financing dashboard](#).

<sup>2</sup> This amount includes carry-over and commitments.

<sup>3</sup> This amount is an estimation of the 2024 annual budget allocation, as of the end of March 2024.

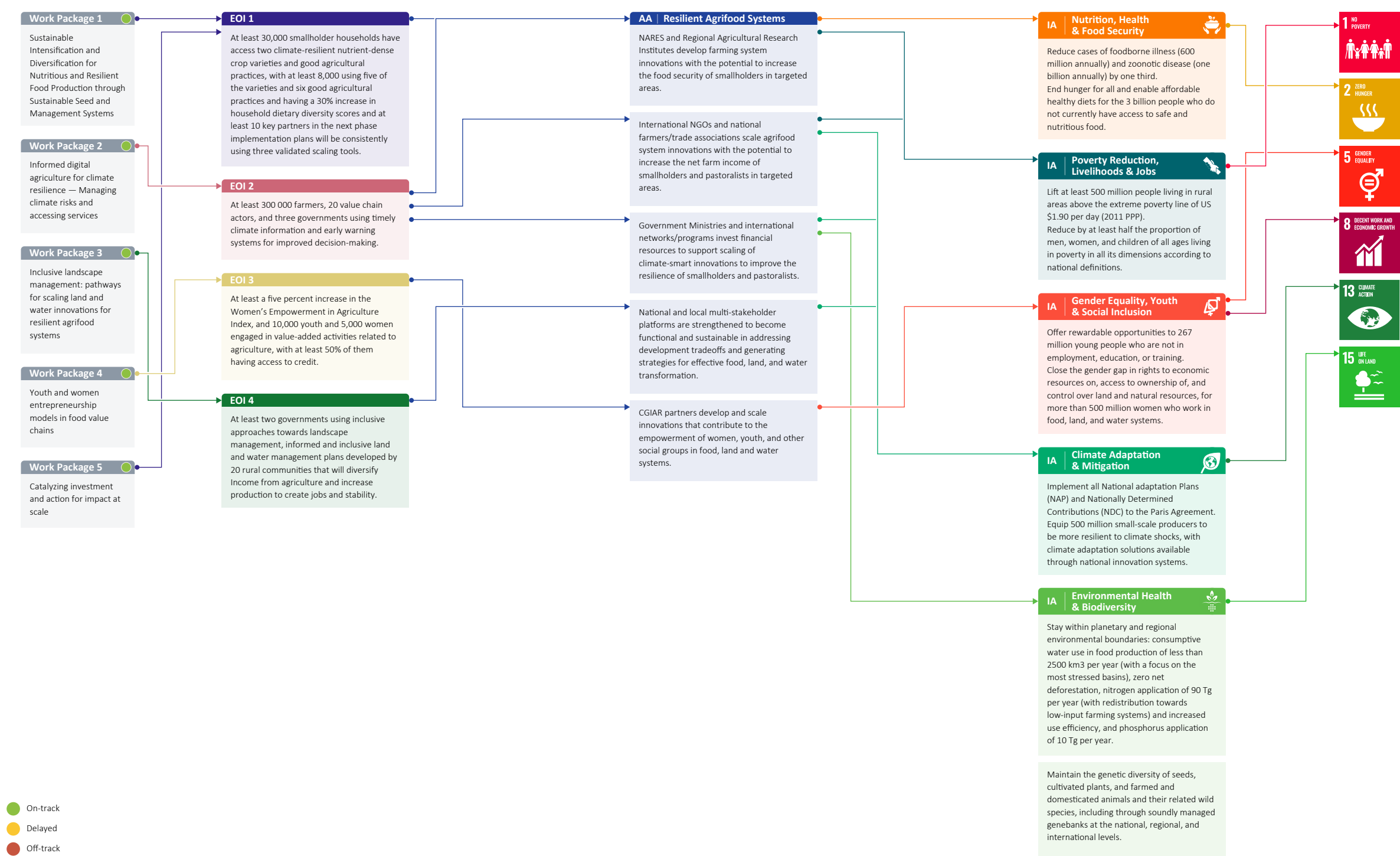




Section 2: Progress on science and towards End of Initiative outcomes

Initiative-level theory of change diagram

This is a simple, linear, and static representation of a complex, non-linear, and dynamic reality. Feedback loops and connections between this Initiative and other Initiatives’ theories of change are excluded for clarity.



EOI | End of Initiative outcome  
AA | Action Area  
IA | Impact Area  
SDG | Sustainable Development Goal

**Note:** A summary of Work Package progress ratings is provided in Section 3.





Hammer mill training application session in Nigeria.  
Credit: IITA, Olumodupe Banwo

## Summary of progress against the theory of change

This Initiative seeks to enhance food and nutrition security, and make agrifood systems climate resilient by:

1. Increasing access to quality seeds of nutrient-rich crops and fish, and climate-smart agriculture practices, and reducing post-harvest losses.
2. Enhancing productivity and climate change adaptation through digital supply-demand services.
3. Empowering women and youth in agribusiness to close gender gaps by providing access to resources and tools.
4. Using landscape management to improve governance of natural resources, environmental health, and biodiversity.
5. Supporting regulatory and policy frameworks to foster inclusive public-private partnerships and scale innovations.

The Initiative addresses research questions on ways to improve smallholder farmers' productivity and climate resilience, drivers of demand for nutritious foods, adoption of digital knowledge systems, participatory management for landscape resilience, and gender equality in agribusiness.

The Initiative involves collaborations with six CGIAR Centers (AfricaRice, CIP, IITA, IWMI, the Alliance of Bioversity International and CIAT, and WorldFish), national agricultural research and extension systems (NARES), universities, international research centers, and other CGIAR Initiatives, focusing on partnerships and subgrants to support its activities in West and Central Africa.

After one year of implementation, the Initiative organized a [pause, reflect, and stakeholders' workshop](#) in Accra, Ghana, from 9 to 12 May, 2023. In total, 60 participants participated in the workshop, including 14 women. Participants were from 11 countries (Benin,

Burundi, Côte d'Ivoire, DRC, Ghana, Kenya, Madagascar, Nigeria, the Netherlands, Rwanda, and Senegal). The workshop helped to facilitate exchanges among the Initiative's stakeholders, take stock of activities carried out during the first year of execution, develop a plan of activities for the second year, and lay out strategies to improve the Initiative's implementation performance.

To better understand the local conditions at the implementation sites, several surveys were conducted. Following 2022 activities, [baseline](#) surveys and [e-registration](#) of value chain actors were completed in the Initiative's six target countries. In total, 22,701 value chain actors were e-registered and 5,660 were surveyed for the baseline. Data were collected on the WEAI in Côte d'Ivoire, Ghana, and Nigeria. Qualitative surveys on social constraints to gender and generational equality were conducted in Côte d'Ivoire and Ghana. Surveys and reports were completed on rice farming practices in [Burundi](#), [DRC](#), and [Rwanda](#); cocoa [rehabilitation](#) in Ghana; modeling of future water scenarios for cocoa farming in Côte d'Ivoire and Ghana; [diversified](#) rice production systems in Côte d'Ivoire and Nigeria; mapping of climate and agronomic digital advisory services landscape and enhancement of flood EWSs in Rwanda and Nigeria; and engagement of communities through citizen science for water quality and quantity assessments in Ghana. These surveys have generated 87 knowledge products, including eight journal articles.

To transform the agrifood system, the Initiative is developing and bringing to scale best-fit and climate-smart innovations and technologies, and has reported 17 innovations. As the Initiative focuses more on scaling readiness, most of the innovations reported (eight innovations) were at least at level 6 out of 9 on the scaling readiness scale. These can go to scale in 2024. The scaling readiness of four innovations increased from 2022 to 2023. The innovations promoted by the Initiative include a biopesticide for the diamondback moth on cabbage, provitamin A-rich banana in Burundi, a seed supply chain (and piloting of [aquaculture](#)) for

GIFT in Nigeria, options for diversification in [rice-based](#) production systems in Côte d'Ivoire and Nigeria, integration of Brachiaria into maize-based cropping systems, improved rice varieties introduced to women's groups, vitamin A-rich orange-fleshed sweet potato puree as a partial substitute for wheat flour in baked products, and the wet hammer mill for processing cassava peels.

For One Health, innovations for waste valorization were explored. Activities focused on converting biomass waste into new value chains and supporting sustainable agro-livestock production and black soldier fly larvae technology. Four digital agroclimatic innovations were piloted, tested, or validated toward achievement of the End of Initiative outcomes (EOIO): (1) EWS for FAW and Striga forecasting in Rwanda, (2) EWS for FAW and Striga forecasting in Ghana, (3) digital agroclimatic advisory (DACA) mobile application in Ghana and (4) remote sensing-based information and insurance for crops in emerging economies (RIICE) in Côte d'Ivoire. In addition to these technologies, the Initiative installed two women and youth agribusiness hubs in Ghana and Côte d'Ivoire, established an [agro-advisory committee](#) in Rwanda to scale the EWS, and held a stakeholders' [consultation workshop](#) to involve stakeholders in designing a dissemination plan tailored to Ghana's context. The Initiative facilitated landscape management plans (LMPs) through multistakeholder dialogues (MSDs) in Ghana and Nigeria. The Partnership Health Checkup Tool developed by the Initiative was successfully piloted with Ghana's GROWING project. To increase the scaling readiness of these innovations, investment action plans for eight innovations were developed during the Investment Action Planning and Scaling Readiness workshop held in July 2023, in Kigali, Rwanda.

These innovations and technologies have positively impacted various value chain actors, especially women and youth. About 51,044 individuals received agroclimatic advisories, enhancing the livelihoods of 11,044 farmer promoters (FPs) and 40,000 farmers through SMS and direct communication. Notably, 100 new smallholders in Nigeria now use genetically improved tilapia, boosting nutrient intake. The adoption of GEM has significantly improved women parboilers' rice output, income, and food security, and has reduced poverty, with adopters seeing a 26 percent decline in the poverty rate and an increase of 140 kg of milled rice and US\$73 per tonne of paddy, compared to traditional methods. Now in 11 African countries, the GEM system helps to reduce hunger and enhance women's livelihoods by offering better rice quality and nutritional value.

The Initiative engaged in 35 capacity-sharing events involving 2,342 stakeholders, including 518 women, which focused on agricultural

best practices, postharvest technologies, and entrepreneurship, furthering skill development. Training sessions were held on processing vitamin A-rich foods, cassava products, and genetically improved tilapia, among others. These sessions benefited numerous processors, millers, and entrepreneurs working in sustainable agriculture and business development.

To present the Initiative's results and achievements, we participated in at least 10 conferences and workshops. We organized a side event on inclusive digital agribusiness model for jobs and scaling innovations in West and Central Africa during [the 8th African Agribusiness and Science Week](#) in Durban, South Africa from 5 to 8 June, 2023.

The Initiative's results target all of CGIAR's five Impact Areas. The Impact Areas on (1) climate change adaptation and mitigation and (2)



Rice-based diversification experiment at Mbe, Cote d'Ivoire.  
Credit: AfricaRice, Aminou Arouna

gender equality, youth, and social inclusion are significant in 68 and 35 results, respectively, while they are principal in 12 and 7 results, respectively. Similarly, the Impact Areas on (1) poverty reduction livelihoods, and jobs and (2) nutrition, health, and food security" are significant in 98 and 58 results, respectively, while they are principal in 2 and 5 results, respectively. Finally, 67 and 7 results contribute significantly and principally, respectively, to the environmental health and biodiversity Impact Area. The Initiative's results contribute to 10 of the United Nations Sustainable Development Goals (SDGs) as follows (in order of greatest importance): SDG1, SDG2, SDG13, SDG5, SDG8, SDG15, SDG6, SDG10, SDG12, and SDG9.



Progress by End of Initiative Outcome

EOIO 1: Nutrient-dense crop varieties and good agricultural practices (GAPs).

At least 30,000 smallholder households having access to climate-resilient nutrient-dense crop varieties and GAPs, with at least 8,000 using five of the varieties and six GAPs, having a 30 percent increase in household dietary diversity scores, and at least 10 key partners in the next phase of implementation plans consistently using three validated scaling tools.

The focus on advancing climate-smart agricultural practices continued, including testing improved rice varieties by women’s cooperatives in Côte d’Ivoire and Ghana, diversifying rice production in Côte d’Ivoire and Nigeria, enhancing banana-coffee and banana-cacao systems in Central Africa, integrating Brachiarea in maize systems, and replacing conventional pesticides with biopesticides against the diamondback moth on cabbage.

To spread innovation knowledge, 19 knowledge products and numerous capacity-sharing events were organized. Efforts to boost the availability of nutritious crop and fish seeds included producing a manual for Nile tilapia cultivation, training 197 individuals in tilapia seed supply, and providing workshops on cultivating provitamin A bananas and orange-fleshed sweet potatoes.

Initiatives to increase the market presence of nutrient-dense foods included promoting provitamin A bananas in Burundi, improving vegetable production in Nigeria, and promoting climate-smart practices for vegetable chains in Ghana. These efforts, aimed at enhancing dietary quality, included field demonstrations, the use of zero-energy cooling chambers, vegetable drying to cut postharvest losses, and nutritionist-led community lectures in Ghana on diet diversification. Additionally, 100 new Nigerian smallholders now have access to nutrient-rich tilapia.

EOIO 2: Climate information and EWS.

At least 300,000 farmers, 20 value chain actors, and three governments using timely climate information and EWS for improved decision-making.

Four digital agroclimatic innovations are being adapted and introduced in three countries (Côte d’Ivoire, Ghana, and Rwanda): (1) strengthening the EWS for FAW and Striga forecasting for Rwanda, (2) piloting the EWS for FAW and striga forecasting for Ghana, (3) calibrating the DACA Mobile Application for Ghana and (4) piloting RIICE for Côte d’Ivoire. Two stakeholder consultation meetings were held to engage more than 20 value chain actors in the development of digital agroclimatic tools in Côte d’Ivoire and Ghana. About 51,044 farmers received FAW and Striga predictions along with agro-advisories in Rwanda. An online survey involving 428 FPs for FAW and 576 FPs for striga showed that more than 90 percent of farmers who received the advisory have applied the recommendations.

EOIO 3: Youth and women’s engagement.

At least a 5 percent increase in the WEAI, and 10,000 youth and 5,000 women engaged in value-added activities related to agriculture, with at least 50 percent of them having access to credit.

Data on the WEIA were gathered in Côte d’Ivoire, Ghana, and Nigeria, alongside a qualitative survey on social constraints to gender and generational equality in agribusiness. A total of 22,701 value chain actors were e-registered, with 5,660 surveyed for baseline data. Two agribusiness hubs for women and youth were set up in Côte d’Ivoire and Ghana, where 20 individuals received entrepreneurship and business development training. An assessment of farmers’ willingness to pay for digital advisory services revealed a preference for cash payment postharvest at US\$9.70 per hectare for contracts spanning more than two seasons, highlighting digital tools as potential business avenues for youth. The impact of the GEM system on women’s livelihoods showed significant benefits, including an extra 140 kg of milled rice per tonne of paddy, or US\$73 in additional income. In Nigeria, six processors were trained to use vitamin A-rich orange-fleshed sweet potato puree as a wheat flour substitute in baking, with improved recipes and processing methods for bread, chapati, and crisps. Training on high-quality cassava flour processing was provided to 109 individuals (93 women, 16 men) for making various pastries and snacks. Additionally, 90 processors and feed millers were trained in using the wet hammer mill for cassava peels processing.

EOIO 4: Landscape management and scaling tools.

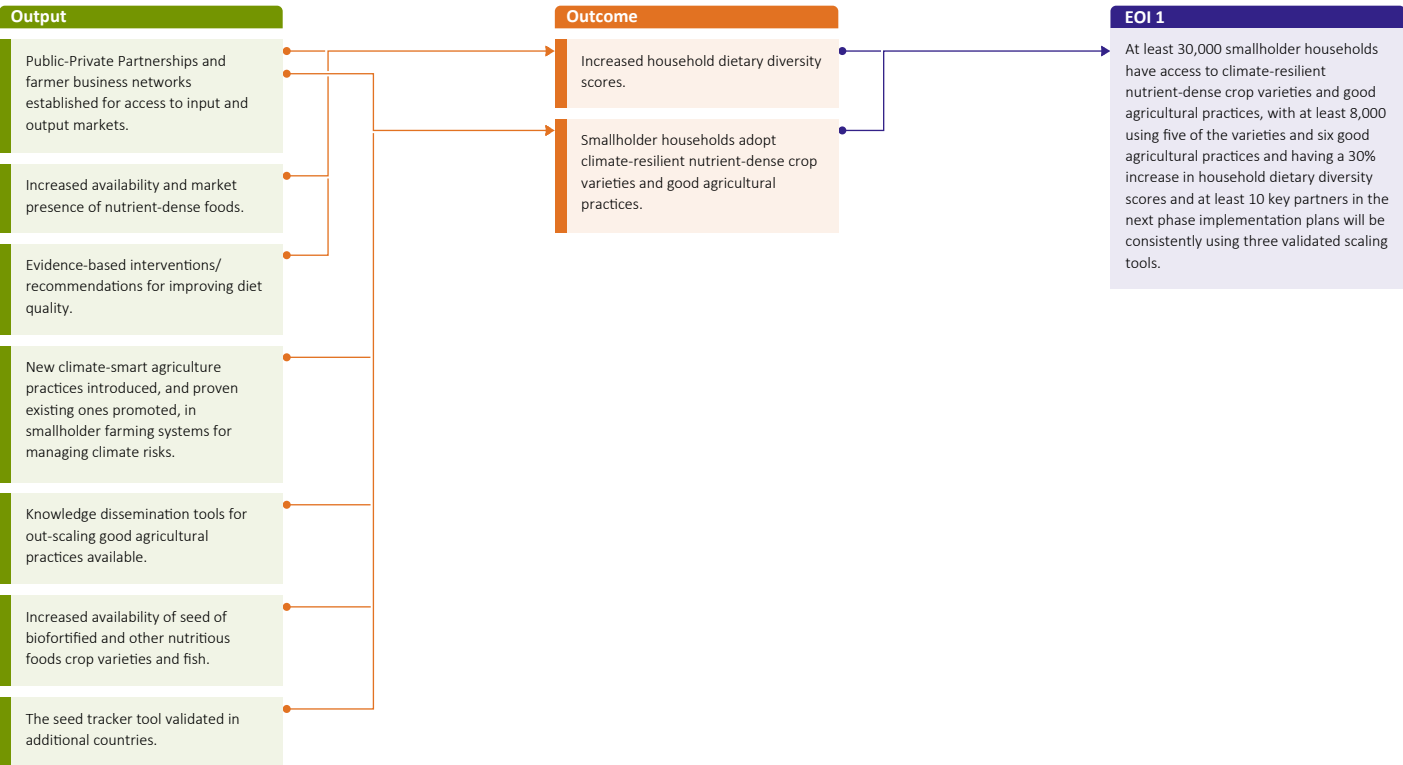
At least two governments using inclusive approaches for landscape management, and 20 rural communities developing informed and inclusive land and water management plans that will diversify income from agriculture and increase production to create jobs and stability

Two LMPs were facilitated in Ghana and Nigeria. These dialogues assessed landscape health, developed inclusive management plans, and fostered knowledge sharing and partnerships. Within the One Health framework, circular bioeconomy innovations for waste valorization were explored. Activities focused on converting biomass waste into new value chains and supporting sustainable agro-livestock production. An investment climate assessment and a report on black soldier fly larvae were developed.

Section 3: Work Package progress

WP1: Sustainable intensification and diversification for nutritious and resilient food production through sustainable seed and management system

On track



Work Package 1 progress against the theory of change

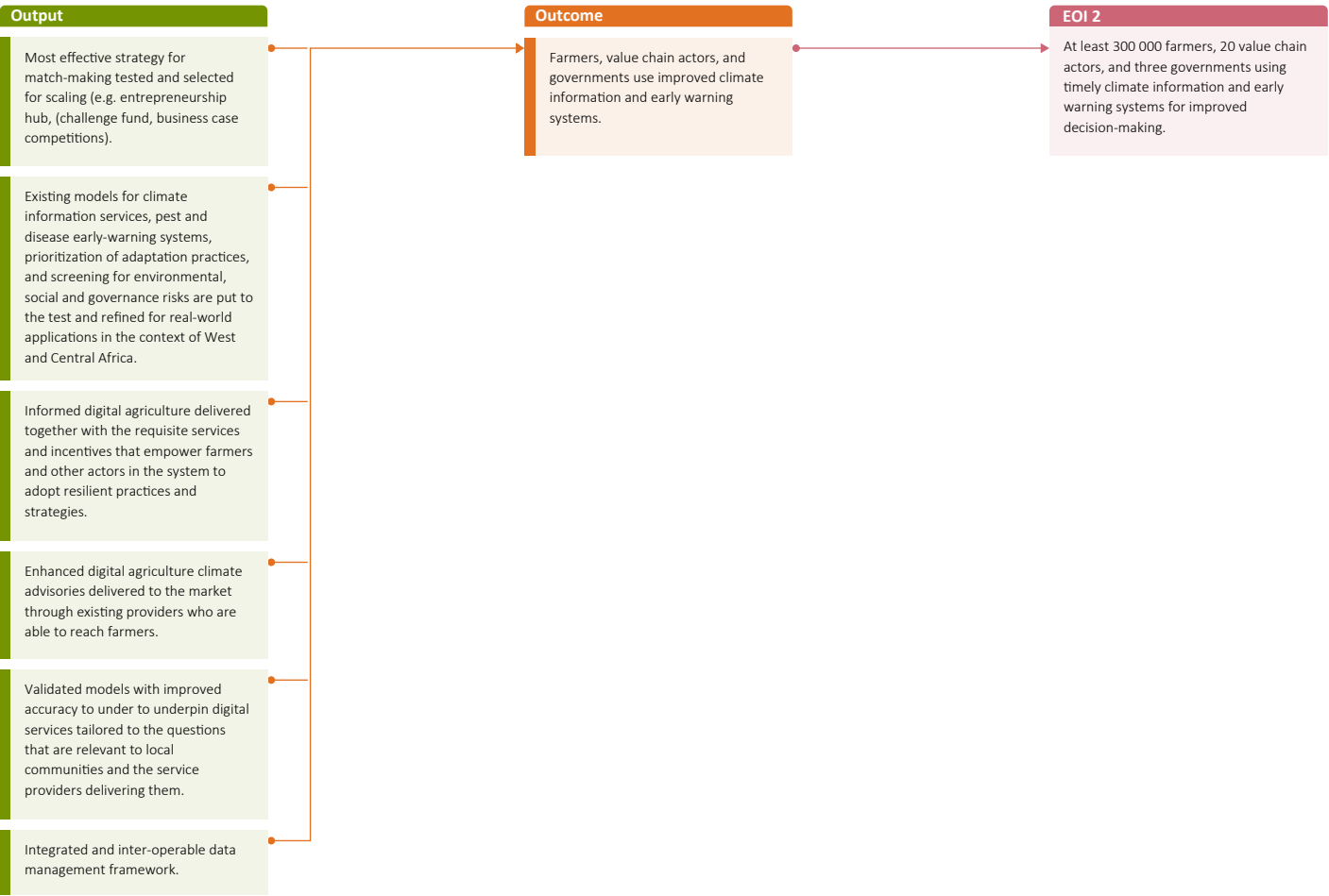
Work Package (WP) 1 aims at promoting nutritious foods, co-designing diverse and sustainable food production systems, promoting GAPs to address climate change and declining soil fertility, and improving seed systems. Good progress has been made in addressing the key research questions on which factors will spur consumer demand for nutritious foods; how smallholder farming systems can be made more productive and adaptive to climate change; and which institutional and capacity support mechanisms will enhance smallholder farmers’ access to markets.

Progress included demonstrating the performance in Ghana of a biopesticide against the diamondback moth on cabbage, promoting provitamin A-rich banana in Burundi, and a seed supply chain (and piloting [aquaculture](#)) for GIFT in Nigeria. The options and benefits of diversification in [rice-based](#) production systems in Côte d’Ivoire and Nigeria were established. Similarly, benefits were demonstrated from integrating Brachiarea into maize-based cropping system of

smallholder farmers. Women farmers’ cooperatives in Bouake in Côte d’Ivoire, and the Ahafo Ano northern and southwestern districts of Ghana tested improved rice varieties introduced by AfricaRice. Capacity-sharing events, involving 969 trainees, focused on banana seed multiplication options; good agronomic practices for sweet potato seed multiplication and marketing for vine multipliers; vegetable production practices in Ghana and Nigeria; and seed supply and outgrowing of tilapia for small- and medium-scale hatchery operators and smallholder fish farmers in Nigeria. Key among the 19 knowledge products delivered were the reports of three completed surveys on understanding of rice farming practices in [Burundi](#), [DRC](#), and [Rwanda](#); a report on cocoa [rehabilitation](#) in Ghana; six reports of studies on [diversified](#) rice production systems in Côte d’Ivoire and Nigeria; and manuals for [Nile](#) tilapia seed production and grow-out aquaculture, and for macro-propagation of healthy banana [plantlets](#).

WP2: Informed digital agriculture for climate resilience—Managing climate risks and accessing services

On track



Work Package 2 progress against the theory of change

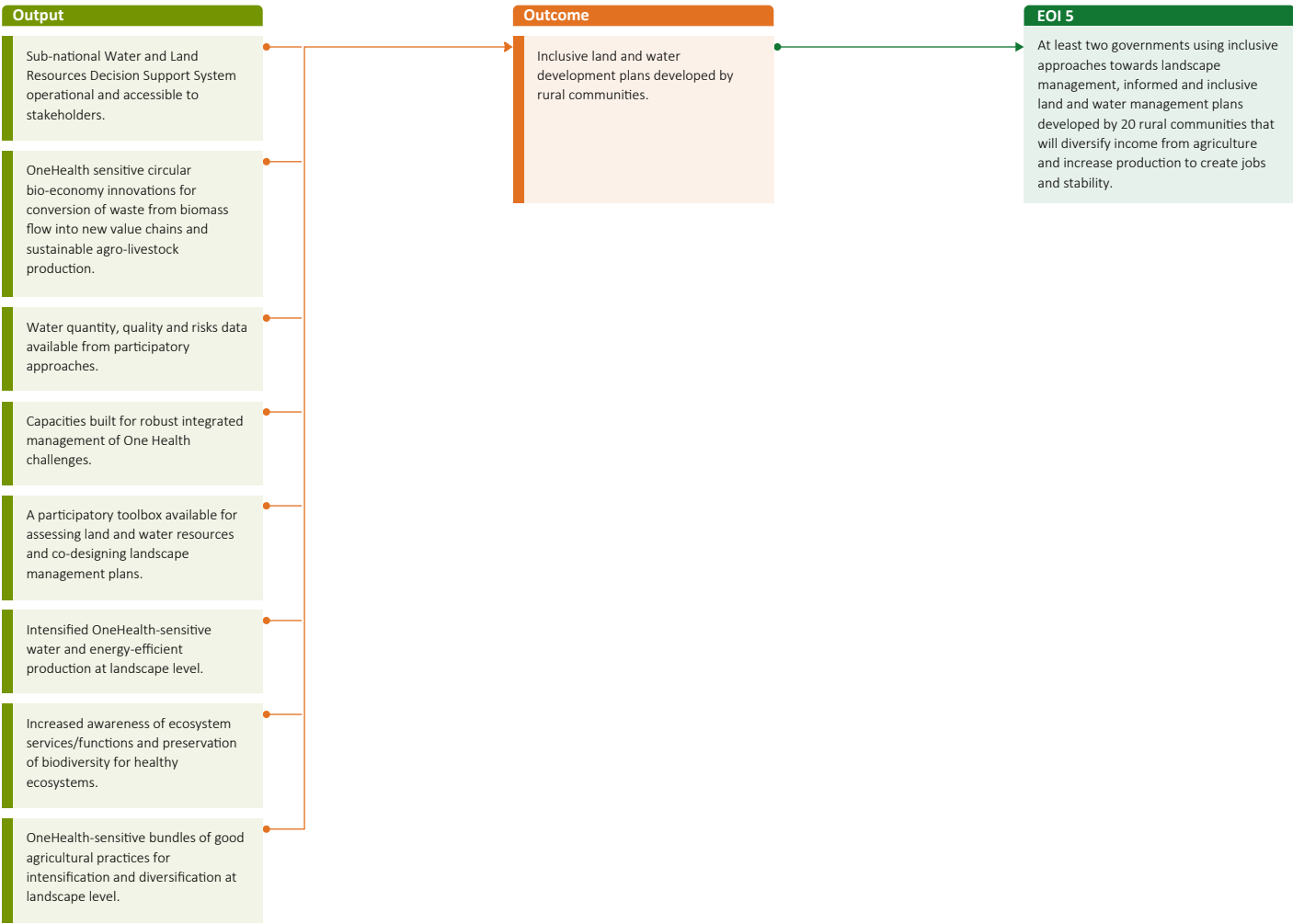
WP2 aims at creating new or improved digital services, and contextualizing and complementing existing digital services for smallholder farmers, value chain actors, and governments for informed decision-making through data harmonization, governance, analysis, and tailored advisory. The WP’s research question relates to knowledge on factors limiting access to, and use of, digital tools and climate advisory services by smallholder farmers in West and Central Africa.

In 2023, four digital agroclimatic innovations were piloted, tested or validated toward achieving the EOIOs: (1) EWS for FAW and Striga forecasting for Rwanda, (2) EWS for FAW and striga forecasting in Ghana, (3) DACA mobile application in Ghana and (4) RIICE in Côte d’Ivoire. The EWS for FAW and Striga forecasting for Rwanda initiated in 2022 was strengthened in 2023 to improve the accuracy of the

predictions (more than 75 percent). An [agro-advisory Committee](#) was established and agroclimatic advisories were disseminated to approximately 51,044 individuals, including 11,044 FPs through SMS and 40,000 farmers through FPs. Building on success in Rwanda, an EWS for FAW and striga forecasting was piloted in Ghana. A stakeholder [consultation workshop](#) was held to involve the stakeholders in designing a dissemination plan tailored to Ghana’s context. The DACA mobile application was [customized](#) to Ghana’s context. Co-development was started for a decision-support tool for monitoring rice area, yield, and climate change impacts in Côte d’Ivoire by customizing the RIICE tool. A [consultation meeting](#) was held to engage stakeholders in piloting the RIICE tool in Côte d’Ivoire. Six country reports on mapping the climate and agronomic digital advisory services landscape, conducted in 2022, were completed and reported in 2023.

WP3: Inclusive landscape management—Pathways for scaling land and water innovations for resilient agrifood systems

On track



Work Package 3 progress against the theory of change

WP3 aims to foster inclusive access to and proper utilization of land and water resources as essential strategies for building resilient agrifood systems and livelihoods within a healthy and productive environment. The critical research questions are formulated around water and land management, One Health–sensitive practices, and the sustaining of ecosystem services.

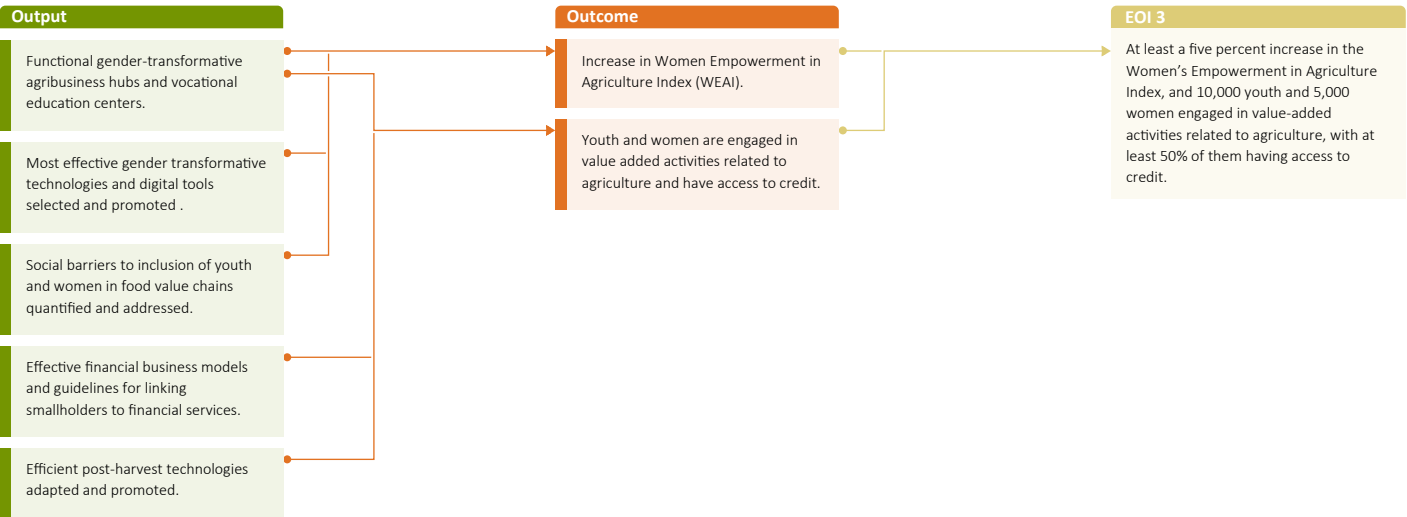
In 2023, WP3 conducted a virtual scoping and needs assessment to identify water management priorities in the region. Activities included enhancing flood EWS in Rwanda and Nigeria, modeling future water scenarios for cocoa farming in Côte d’Ivoire and Ghana, and engaging communities through citizen science for water quality and quantity assessment in Ghana. By combining innovative approaches, data analysis, citizen science, and partnerships, the Initiative generated significant knowledge products for sustainable

water management, empowering communities to face future water challenges. The LMPs through MSDs were facilitated in Ghana and Nigeria. These dialogues assessed landscape health, developed inclusive management plans, and fostered knowledge sharing and partnerships. This inclusive approach resulted in the development of a practical guide and a co-design framework for landscape planning. The 2023 activities highlight the power of participatory planning for sustainable landscape management and community empowerment. The knowledge and tools can be replicated and adapted across diverse contexts. Within the One Health framework, circular bioeconomy innovations for waste valorization were explored. Activities focused on converting biomass waste into new value chains and supporting sustainable agro-livestock production. This included an investment climate assessment and a report on black soldier fly larvae technology. .



WP4: Youth and women entrepreneurship models in food value chains

On track



Work Package 4 progress against the theory of change

WP4 aims at promoting and preparing youth and women for agribusiness while addressing social barriers. The research questions are related to mechanisms and policy advocacy tools for access to finance and market linkages; the addressing of social constraints to gender and generational equality in agribusiness; and the scaling of technologies and digital tools to enhance the sustainability of agribusiness hubs and reduce postharvest losses.

Two women and youth agribusiness hubs were installed in Côte d'Ivoire and Ghana. Following activities in 2022, [baseline](#) surveys and [e-registration](#) of value chain actors were completed in the Initiative's six target countries. In total, 22,701 value chain actors were e-registered and 5,660 surveyed for the baseline. Data were collected on the WEIA in Côte d'Ivoire, Ghana, and Nigeria. A qualitative survey on social constraints to gender and generational equality was conducted in Côte d'Ivoire and Ghana. To create

agribusiness opportunity for youth, we assessed [farmers' willingness to pay](#) for digital advisory services. Forty-nine percent of farmers selected, as their first option, cash payment after harvest at US\$9.70 per hectare for more than a two season-long contract. This shows that youth can develop business around digital tools to create job opportunities. Processing activities are dominated by women. The [impact](#) of GEM on women's livelihoods was conducted. Results showed that the GEM system allows women to gain an additional 140 kg of milled rice per tonne of paddy, equivalent to US\$73. Six processors were trained on using vitamin A-rich orange-fleshed sweet potato puree as a partial substitute for wheat flour in baked products, and 90 processors and feed millers were trained on the use of the wet hammer mill and processing of cassava peels. In addition, 109 people were trained on processing cassava flour, and 20 youth and women were trained on entrepreneurship and business development skills.

WP5: Technology, innovation, communication, knowledge, and stakeholder management for accelerating impact investments and catalyzing impact at scale

On track



Work Package 5 progress against the theory of change

WP5 has been instrumental in driving agricultural transformation across West and Central Africa, focusing on empowering partners to achieve impactful outcomes at scale. Central to this effort was the Investment Action Planning and Scaling Readiness workshop held in Kigali, Rwanda, in July 2023, during which Investment Action Plans for eight innovations were developed. While resource constraints posed challenges, partners successfully completed an investment plan for processing orange-fleshed sweet potatoes in Rwanda, showcasing their commitment to scaling innovations.

Valuable resources were developed, including guidelines for community engagement, which provide a roadmap for introducing climate-resilient crops and promoting best practices. Understanding consumer preferences was prioritized through a study on sweet potato product popularity in Rwanda titled "Assessment of Preference and Demand for Sweet Potato Value-Added Products among Consumers in Rwanda," which guided targeted interventions toward stimulating urban demand and changing behaviors. The

Scaling Readiness Framework was utilized to guide partners in crafting investment plans, ensuring they are well prepared to scale agricultural innovations effectively. Building strong partnerships was another focus, with the successful piloting of the Partnership Health Checkup Tool in Ghana's GROWING project.

Looking forward, fundraising for digital solutions and advocacy for supportive policy environments is on the agenda. Efforts to explore potential investors for digital integration aim to extend the reach and impact of agricultural interventions. Plans to identify and support influential advocates in 2024 will be crucial for fostering an environment conducive to agricultural innovation. WP5 has made significant strides, laying a solid foundation for agricultural advancements to benefit millions across the region. Through knowledge dissemination, collaboration enhancement, and innovative approaches, WP5's activities continue to drive meaningful change in West and Central Africa's agricultural landscape.





Rice-based diversification experiment at Mbe, Cote d'Ivoire.  
Credit: AfricaRice, Aminou Arouna

Work Package progress rating summary

WORK PACKAGE	PROGRESS RATING & RATIONALE
1	<div><div></div><div><b>Progress rating</b> Good progress was made toward achieving the outputs in the Plan of Results within the final approved budget and in line with the theory of change. Seven incremental innovations were promoted. Twelve short-term capacity-sharing activities were conducted in person and involved 969 participants. Nineteen knowledge products were delivered, which report a range of completed studies and provide guides that are useful for scaling innovations.</div></div>
2	<div><div></div><div><b>Progress rating</b> Four digital solutions for climate and environmental risk management in three countries (one in Côte d'Ivoire, two in Ghana, and one in Rwanda) are being developed and promoted with a high probability of being by the three governments. More than 50,000 farmers received FAW, Striga predictions, and agro-advisories. Four out of the six outputs have been achieved.</div></div>
3	<div><div></div><div><b>Progress rating</b> The annual progress largely aligns with the Plan of Results and Budget (PORB) and WP theory of change. There was a small delay in co-developing LMPs for Burundi and Rwanda, but the issues have been resolved and the partners are prepared to complete these tasks by the end of 2024 Q1.</div></div>
4	<div><div></div><div><b>Progress rating</b> Following the theory of change, the WP's activities have contributed to expected outputs toward achieving the EOIOs. Results in 2023 contributed to WP4's two outcomes: WEIA was assessed in three countries (outcome 4.1) and youth and women were engaged in agribusiness (outcome 4.2). Activities contributed directly to four outputs (output 4.1.1, output 4.1.2, output 4.1.3, and output 4.2.2).</div></div>
5	<div><div></div><div><b>Progress rating</b> WP5 utilizes evidence-based management solutions to drive impactful outcomes at scale in West and Central Africa. Through activities such as workshops, guideline development, and studies on consumer preferences, WP5 aims to increase investment, foster collaboration, and promote adoption of agricultural innovations. By piloting tools like the Partnership Health Checkup Tool, the Initiative also strengthens partnerships and enhances collaboration among stakeholders. Activities contributed directly to three outputs (output 5.1.1, output 5.1.2, and output 5.1.3).</div></div>

Definitions

<div><div></div><div><b>On track</b></div></div> <div><div><div></div><div>Annual progress largely aligns with Plan of Results and Budget and Work Package theory of change.</div></div><div><div></div><div>Can include small deviations/issues/delays/risks that do not jeopardize success of Work Package.</div></div></div>	<div><div></div><div><b>Delayed</b></div></div> <div><div><div></div><div>Annual progress slightly falls behind Plan of Results and Budget and Work Package theory of change in key areas.</div></div><div><div></div><div>Deviations/issues/delays/risks could jeopardize success of Work Package if not managed appropriately.</div></div></div>	<div><div></div><div><b>Off track</b></div></div> <div><div><div></div><div>Annual progress clearly falls behind Plan of Results and Budget and Work Package theory of change in most/all areas.</div></div><div><div></div><div>Deviations/issues/delays/risks do jeopardize success of Work Package.</div></div></div>
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Products made from High-quality Cassava Flour (HQCF).  
Credit: IITA, Olumodupe Banwo

## Section 4: Key results

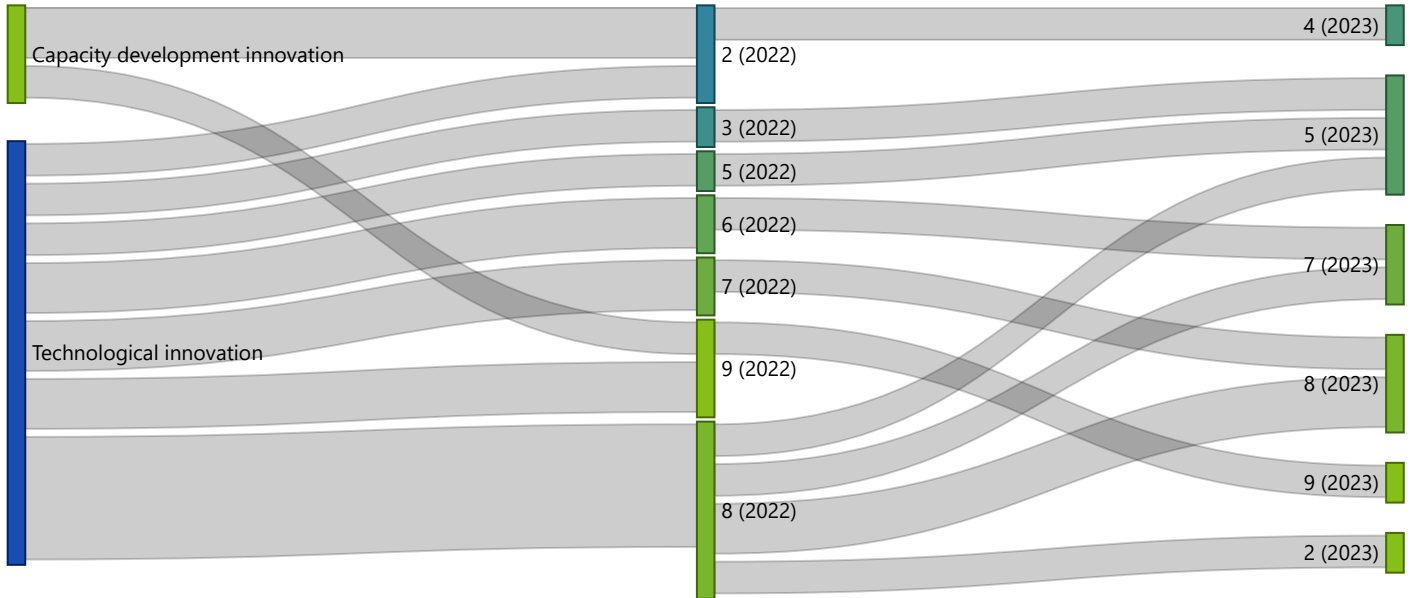
This section provides an overview of results reported by the CGIAR Research Initiative on West and Central African Food Systems Transformation in 2023. These results align with the CGIAR Results Framework and West and Central African Food Systems Transformation’s theory of change. Source: Data extracted from the [CGIAR Results Dashboard](#) on 29 March 2024.

### OVERVIEW OF REPORTED RESULTS



The Initiative reported 141 results in 2023. In total, 35 capacity sharing events were organized, which benefited 2,342 actors, including 518 women (22 percent), and were related to GAPs, postharvest technologies, value chain improvement and entrepreneurship, and business development skills for youth and women. To improve innovators’ readiness, a workshop was organized for technology scaling in Rwanda.

### PROGRESS IN SCALING READINESS LEVELS FOR REPORTED INNOVATIONS



Innovation type	Discontinued from 2022 to 2023	Increased readiness level	Decreased readiness level	Same readiness level	Total
Technological	4	4	3	4	15
Capacity development	3				3
Total	7	4	3	4	18

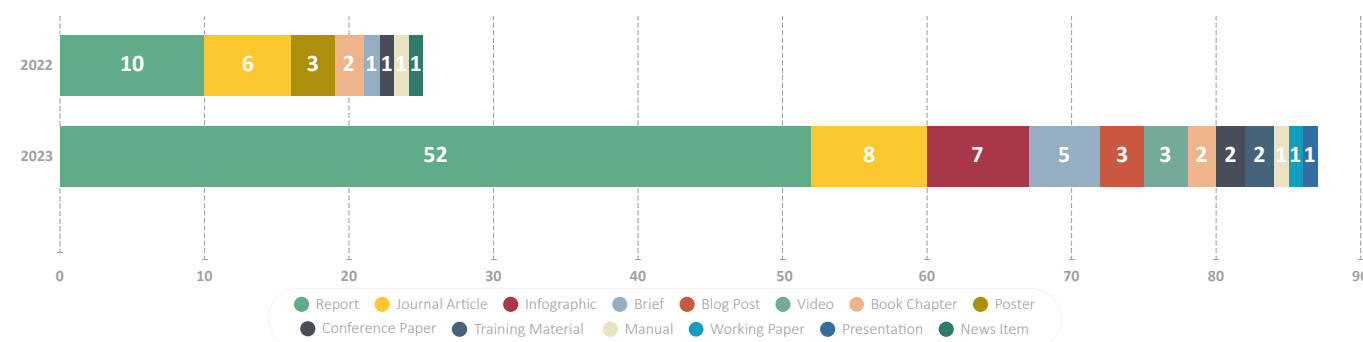
The Initiative also reported 17 innovations in 2023. As the Initiative is focusing more on the scaling readiness of its innovations, most of the innovations reported (eight) were at least at level 6 out 9 on the scaling readiness scale. Eight innovations were tested (controlled and uncontrolled) and can go to scale in 2024. Between 2022 and 2023, the Initiative increased the level of four innovations, while four other innovations remain at the same level.



## NUMBER OF INNOVATIONS BY READINESS LEVEL

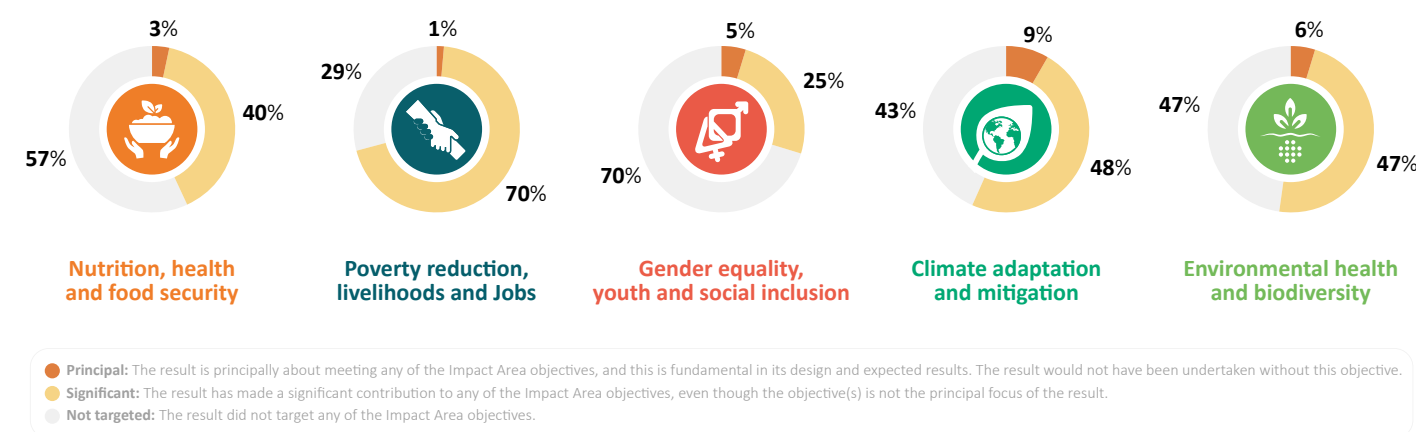


## NUMBER OF KNOWLEDGE PRODUCTS BY TYPE (TREND OVERVIEW, 2022-2023)



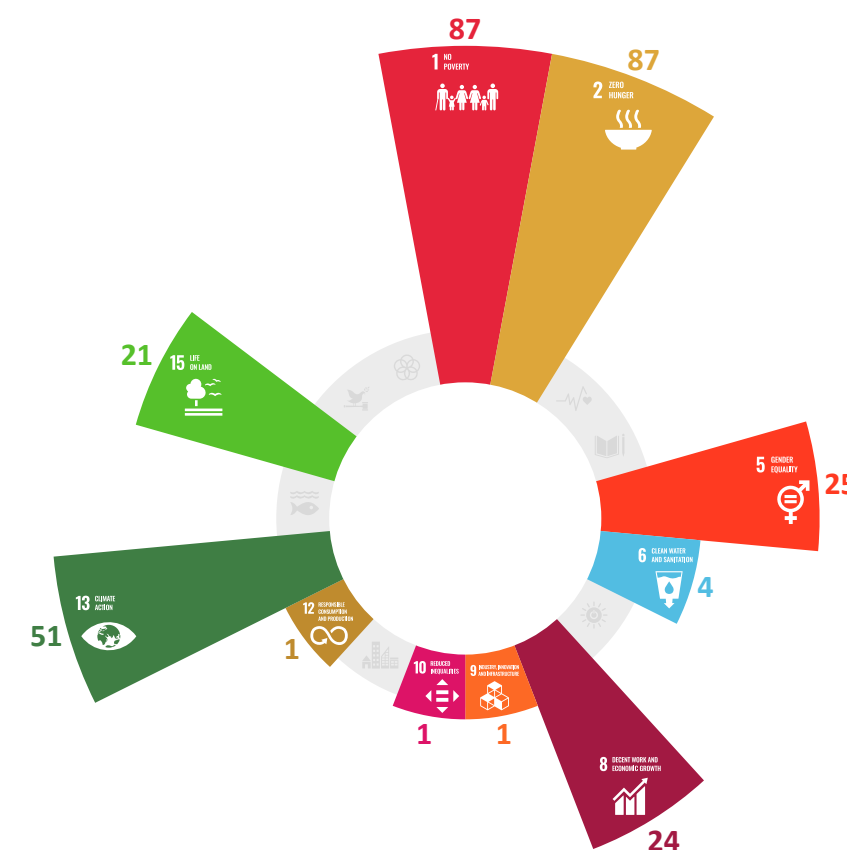
The Initiative contributed to 87 knowledge products, including eight journal articles. In terms of outcomes, the Initiative contributed to one policy change related to improving policy, regulation, and practices in seed sector in Rwanda. The result was reported by Seed Equal with contributions from this Initiative. It is important to note the policy is at stage 1 (research taken up by next user, policy change not yet enacted).

## PERCENTAGE OF REPORTED RESULTS TAGGED TO CGIAR IMPACT AREAS



The Initiative's results target all of CGIAR's five Impact Areas. The Impact Areas on (1) climate change adaptation and mitigation and (2) gender equality, youth, and social inclusion are significant in 68 and 35 results, respectively, while they are principal in 12 and 7 results, respectively. Similarly, the Impact Areas on (1) poverty reduction livelihoods, and jobs and (2) nutrition, health, and food security" are significant in 98 and 58 results, respectively, while they are principal in 2 and 5 results, respectively. Finally, 67 and 7 results contribute significantly and principally, respectively, to the environmental health and biodiversity Impact Area.

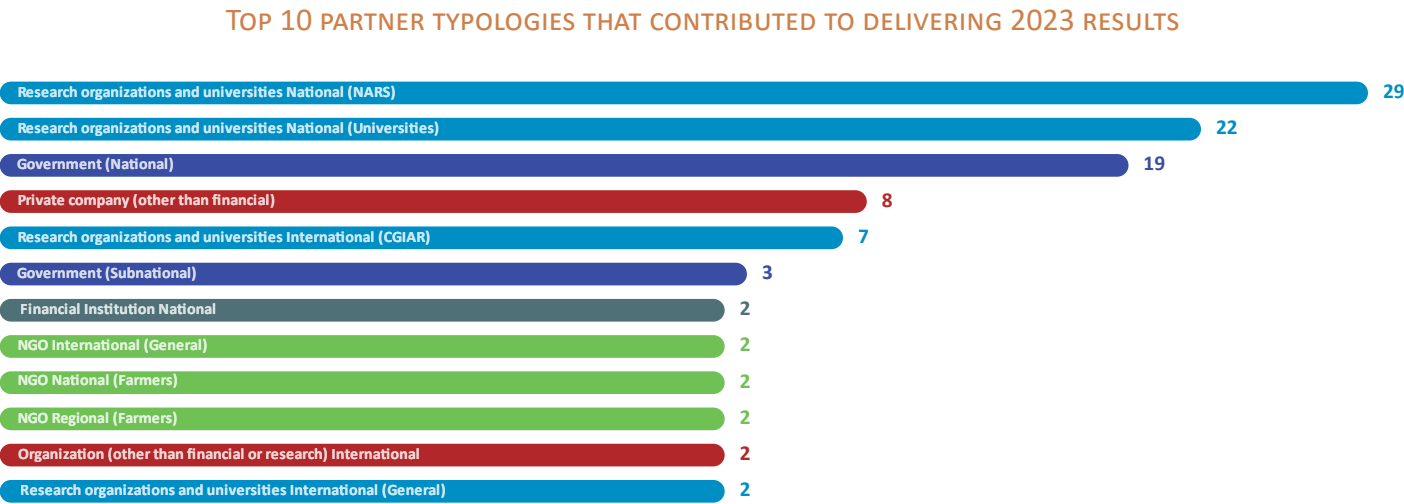
## CONTRIBUTIONS TO THE UN SUSTAINABLE DEVELOPMENT GOALS



The Initiative's results contribute to 10 of the United Nations Sustainable Development Goals (SDGs) as follows (in order of greatest importance): SDG1, SDG2, SDG13, SDG5, SDG8, SDG15, SDG6, SDG10, SDG12, and SDG9.



Section 5: Partnerships



Source: Data extracted from the Results Dashboard, on 13 March, 2024 (CGIAR Results Dashboard)

Partnerships and West and Central African Food Systems Transformation’s impact pathways

Building on the partnership workshop held in 2022, the Initiative organized a [pause, reflect, and stakeholders’ workshop](#) in Accra, Ghana from 9 to 12 May, 2023. In total, 60 participants participated in the workshop, including 14 women. Participants were from 11 countries (Benin, Burundi, Côte d’Ivoire, DRC, Ghana, Kenya, Madagascar, Nigeria, the Netherlands, Rwanda, and Senegal).

For the 141 results reported in 2023, the Initiative worked with 56 innovation partners, 29 with scaling partners and 14 with demand partners. Forty-nine results were co-produced with national research organizations and universities. In-country activities were jointly implemented with NARES in the Initiative’s six target countries.

In 2023, implementation subcontracts were signed with the following NARES: [Council for Scientific and Industrial Research](#) in Ghana, [Centre National de Recherche Agronomique in Côte d’Ivoire](#), and [National Cereals Research Institute](#) in Nigeria. To coordinate and develop tools and methods to strengthen the partnerships, a collaboration was initiated with [CORAF](#) as a regional organization. Partnerships with non-CGIAR international institutions included improvements to vegetable production with the [World Vegetable Centre](#); development of decision-support tools for fertilizer recommendations in Burundi with the [International Fertilizer Development Centre](#); and development of an EWS for FAW and striga management in Rwanda with the [International Centre of Insect Physiology and Ecology](#).

Section 6: CGIAR Portfolio linkages

Portfolio linkages and West and Central African Food Systems Transformation’s impact pathways

In 2023, the Initiative increased its collaboration with other CGIAR Initiatives. During [the pause, reflect, and stakeholder workshop organized](#) by the Initiative from 9 to 12 May, 2023, a special session was organized to discuss collaboration with other CGIAR Initiatives. The Initiative has designated focal persons for seven other Initiatives (Digital Innovation, Excellence in Agronomy, Plant Health, Diversification in East and Southern Africa, Seed Equal, Market intelligence, and Gender Equality).

The Initiative also collaborated with CGIAR’s three Science Groups. In the Systems Transformation Science Group, the Initiative collaborated with Digital Innovation and Climate Resilience to work on digital tools to deliver climate information that increases the resilience of smallholder farmers to climate change. The Initiative

has also collaborated with Digital Innovation and Climate Resilience to co-develop a decision support tool for monitoring rice area, yield, and climate change impacts on rice production in Côte d’Ivoire. The collaboration with the Resilient Agrifood Systems Science Group was done mainly with the Excellence in Agronomy, Plant Health, and Diversification in East and Southern Africa Initiatives to test agronomic practices. In the Genetic Innovation Science Group, collaboration was with Seed Equal and Market Intelligence to test early seed generation and assess farmers’ demand for seed from hybrid rice varieties, respectively. As a result, the Initiatives jointly reported a policy change to improve policy, regulation, and practices in Rwanda’s seed sector.



Multistakeholder sub-group mapping a shared landscape vision for the target landscape in Ghana. Credit: IWMI (2023), Gerald Atampugre





Rice-based diversification experiment at Mbe, Cote d'Ivoire.  
Credit: AfricaRice (2023), Aminou Arouna

## Section 7: Adaptive management

RECOMMENDATION	SUPPORTING RATIONALE
Consider the results of the evaluability assessment to refine the Initiative’s indicators.	The Initiative was one of four that benefited from the evaluability assessment in 2023. Following the recommendations, EOIO indicators will be reviewed. We need to ensure that indicators are measurable and smart. In addition, more data will be collected to complete the baseline survey. Finally, the monitoring mechanism will be refined and implemented.
Increase collaboration and partnership with CGIAR Initiatives and programs in West and Central Africa.	In 2023, the Initiative increased its collaboration with CGIAR Initiatives, mainly Excellence in Agronomy, Plant health, and Digital Innovation, as well as programs in West and Central Africa such as the Food Systems Resilience program, Program for Seed System Innovation for Vegetatively-Propagated Crops in Africa, and Technologies for African Agricultural Transformation. The pause and reflect event recommended strengthening the collaboration with these Initiatives and programs. As the focal persons have already been appointed, clear objectives and mechanisms for collaboration need to be defined. Focal points also need to report progress on a quarterly basis.
Expand Initiative activities to countries in the Sahel region, subject to success in resource mobilization from bilateral and multilateral sources.	The Initiative concerns West and Central Africa, with a current focus on the humid and coastal regions. The aim is to expand the Initiative’s activities to the Sahel region to contribute to the urgent need to address major challenges and crises in this region by tapping into and leveraging ongoing and potential investments by multilateral and bilateral organizations. The Initiative jointly submitted a proposal with <a href="#">Wageningen University &amp; Research</a> in 2023, with aims to continues this effort.
Strengthen results-based management of the Initiative to increase the potential of achieving its objectives.	Following the Initiatives’ reporting system, the Initiative’s budgeting needs to be more closely linked to expected outputs/outcomes rather than activities. Each dollar in the Initiative’s budget needs to contribute to specific target outputs/outcomes. The Initiative needs to plan the number and types of expected outputs/outcomes.



Section 8: Key result story

Improved parboiling technology increases women’s income and nutrition

The GEM parboiling system allows women to gain 140 kg of milled rice and US\$73 per tonne in Benin.



Internal view of the rice parboiling complex in Glazoue, Benin. Credit: AfricaRice (2015); Ndindeng et al. (2015)

Food insecurity and child malnutrition remain persistent problems in sub-Saharan Africa (SSA). GEM, an improved parboiling system developed by AfricaRice and its national partners, leads to better physical and nutritional properties of processed rice than the traditional system. Compared to the traditional system, GEM allows women in Benin to gain an additional 140 kg of milled rice per tonne of paddy and US\$73 per tonne.

Micronutrient deficiencies, or “hidden hunger,” are on the rise in SSA, affecting one in every two Africans. At the same time, little progress has been made to reduce undernutrition. The region has the highest prevalence of undernutrition, with 98 million children affected by stunting.

To improve the nutritional quality of rice as a staple food crop, AfricaRice and partners developed GEM, an improved parboiling system that allows rice to be processed with better physical and nutritional properties compared to the traditional system. GEM is an improved parboiling technology that uses both a uniform steam parboiler and an improved parboiling stove. The GEM system is not only about the equipment but also the improved process.

After first being introduced in 2015 by the CGIAR Research Program on Rice , the GEM system has now been scaled to 11 African countries. The Initiative builds on the existing GEM equipment to strengthen women’s technical capacity, such as through the process of parboiling rice with GEM, and soft skills, such as business skills, marketing strategies, and personal development. The Initiative has

also helped to link women parboilers to markets through its women and youth innovation platform.

The Initiative funded a study to assess the impact of the system’s adoption on women’s livelihoods. Results showed that adopting the GEM system increased women parboilers’ rice output rate (dehulling return), income, and food security, and reduced poverty. Compared to the traditional system, GEM allows women to gain an additional 140 kg of milled rice per tonne of paddy and US\$73 of additional income. Adoption of the GEM system also reduced the poverty rate by 26 percent among adopter households. These results are supported by women’s perceptions that the output rate, better nutritional value, and reduction in the amount of broken rice during dehulling are major advantages of the new parboiling system. This shows that parboiled rice using improved equipment and methods can not only reduce hidden hunger in SSA but also improve women’s livelihoods.

Women in 36 areas in 11 African countries are benefiting now from the GEM system: 23 areas in West Africa (Bante, Glazoue, Malanville, and Savalou in Benin; Gaya in Niger; Goronyo and Nasarawa in Nigeria; Soutouboua in Togo; Abidjan, Bouake Dar Salam, Bouake marché de gros, Boundiali, Daloa, Gagnoa, Korhogo, Man, and Odiene in Côte d’Ivoire; Baguineda, Dioro, San, and Segou in Mali; and Saint Louis in Senegal); one area in Central Africa (Nkolfolou-Yaounde in Cameroon), and 12 areas in East Africa (Bahidar and Woreta in Ethiopia; Ambatondrazaka, Ankazomiriotra, Antanarivo, Antsirabe, Antsohihy, Mahabo, and Tanandava in Madagascar; and Gaza, Sofala, and Zambezia in Mozambique).

Primary Impact Area



Other relevant Impact Areas targeted



Contributing Initiative

West and Central African Food Systems Transformation

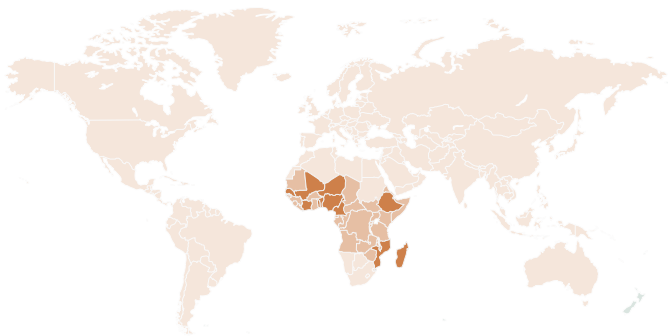
Contributing Center

AfricaRice

Contributing external partner

National Agricultural Research Institute of Benin

Geographic scope



Regions: West Africa · Central Africa · East Africa

Countries: Benin · Niger · Nigeria · Togo · Côte d’Ivoire · Mali · Senegal · Cameroon · Ethiopia · Madagascar · Mozambique





#### Front cover photo

Rice Parboiling equipment at Mbe, Cote d'Ivoire.  
Credit AfricaRice (2023), Sali Ndindeng

#### Back cover photo

Pause, reflect and stakeholder workshop of TAFS-  
WCA, Accra, Ghana.  
Credit: AfricaRice (2023), Murielle Anougbre



INITIATIVE ON

West and Central African  
Food Systems Transformation